

THE BIOLOGIST

A Quarterly Journal Promoting Research
Interest in the Biological Sciences

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THE BIOLOGIST

EDITOR: Dr. Anselm M. Keefe, St. Norbert College, West DePere, Wisconsin

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THE BIOLOGIST

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DEAN L. H. SNYDER

Geneticist and Author

Honorary President of Phi Sigma

(*Norman Transcript and the Oklahoman-Times Norman Bureau*) Norman, Jan. 15—Dr. Laurence H. Snyder, dean of the Graduate College and director of organized research at the University, was chosen today as honorary president of Phi Sigma, international honorary biology fraternity.

The honor is a singular one, since the office is reserved for the scholar who is considered to be the most outstanding biologist in the world. Dean Snyder's election is for a four-year term.

Organized First Class

Dr. Snyder organized the first class in genetics ever taught to medical students in this country, and he and his students have originated and established every course in medical genetics now being taught. He is the author of one of the first texts on genetics written in English, which was published 30 years ago and continues to be the most widely used of any elementary text in the field. It will soon go into its fifth edition.

The Oklahoma scientist became interested in blood groups while he was an undergraduate at Rutgers University. His doctoral dissertation was written on the subject. His book, "Blood Groups in Clinical and Legal Medicine" was the first written in English, and the author was sent by the American Medical Association to report on his findings before the Royal Dutch Academy of Science.

Genetic Pioneer

In addition to being the foremost pioneer in the field of human genetics, Dr. Snyder is probably best known for devising the methods of studying human genetics. He has established the basis for genetic counseling throughout the world and for the practical application of heredity in the prevention of disease and diagnosing. For many years he has served as the consultant in medical genetics for the U. S. Army.

Dr. Snyder will give his 1,000th public lecture this spring. He has spoken in England, Germany, the Netherlands, Norway, Sweden, Puerto Rico,

Alaska and every one of the 48 states except North Dakota — where he will lecture this spring.

The study of the effect of inheritance has been a long uphill struggle for Snyder, a University of Oklahoma zoology professor and dean of the graduate school.

When he was an undergraduate at Rutgers university in the early 1920s, he had to do the recruiting to get a course offered. For years he had to carry the torch alone. Now he can look at the results and know satisfaction.

"We can give specific information and answers to questions about particular traits and diseases that are carried in heredity. There are many instances where we can prevent the reappearance of a trait. Now we know where to look and where to find what we are looking for."

What can be transmitted by heredity?

BALDNESS for example. The work of the medical geneticist has proven that each bald father will pass on the shiny pate to one-half of his sons and one-half of his daughters will carry the baldness to one-half of her sons.

Snyder says there seems to be very little evidence of any inheritance of cancer. Tuberculosis? Yes! Varicose veins? Yes! Hairlip? Definitely! Muscular dystrophy? Definitely! Some traits skip a generation. Some pass only from one sex to another.

Snyder organized the first class in genetics ever taught, to medical students in this country but either he or his students have originated and es-

tablished every course in medical genetics now being taught in this country.

He is author of one of the first texts on genetics in the English language 30 years ago, and it is still the most widely used of any elementary text in the field and will soon go into its fifth edition.

In addition to being the pioneer in this field, the blue-eyed university scientist is probably best known for devising the best methods of studying human genetics. He has originated the most practical methods of giving information to families on traits.

QUESTIONS most often asked Snyder include whether a light skinned mulatto and a white person could have a black child. The answer is always the same and has been proven beyond a doubt: The child can never be darker than the darkest skinned parent unless both parents have even a small portion of African blood, in which case the child can be darker than either parent.

Cousins often write to Dr. Snyder at Norman and ask whether it is safe for them to marry and have children. In general, he advises that, unless there are undesirable traits in their ancestry there is absolutely no danger in cousins marrying and having children.

Interestingly enough, the "father of human genetics" is himself a very interesting example of human inheritance. He is color blind. He sees only shades of tan and gray. One of his life long regrets is that he has never been able to see a red cardinal in a green tree.

HARLEY JONES VAN CLEAVE 1866-1953

By F. B. Adamstone

*Head, Department of Zoology
University of Illinois*

Harley Jones Van Cleave was born October 5, 1866, at Knoxville, Illinois. He was the son of Jasper and Mary Jones Van Cleave. He received his early training in the local schools, and, after graduation from high school, attended Knox College at Galesburg, Illinois. In 1909 he received the degree of Bachelor of Science. During this period he developed a great interest in biology which was to become his future life interest. After graduation from Knox College he entered the Graduate School of the University of Illinois and in 1910 received his Master's degree in Zoology. He continued work toward the Doctor's degree with Professor Henry B. Ward under whose direction he completed a thesis entitled "Studies on Cell Constancy in *Neorhynchus* with Descriptions of New Species in that genus." He received his Doctorate in Zoology in 1913.

He was then appointed to an instructorship in the Department of Zoology at the University of Illinois. The following year he married Bernice Ford who was also a graduate of the University of Illinois. They had two children, Dorothy Lucille and Philip Ford. As a member of the faculty of the University, Dr. Van Cleave rose through the ranks to a Professorship in 1929 and in 1948 was given the rank of Research Professor in Zoology.

As a teacher, Professor Van Cleave was most intimately associated with the work in invertebrate and field zoology (which he took over on the retirement of the late Professor Frank Smith) and in parasitology which was his original research interest. His chief

attention as a research worker also centered in these fields and he became an international authority on the *Acanthocephala* — a group of parasites known commonly as the thorny-headed worms. He published widely in the areas of his special research and also in many other fields which came with his interest. His listed publications total more than 324 articles including a number of books and extensive monographs. The volume of his output was truly monumental.

During all these years of teaching and research he directed the graduate work of a large number of masters and doctoral candidates. To the students with whom he worked, these were rich years full of the pleasure of association with a man who was kindly and generous and who always had their best interests at heart. But beyond that he was an exacting scholar teaching them and demanding their best in scientific achievement.

As a member of the faculty of the University, Dr. Van Cleave did his full share of committee work and left his mark through his interests in all phases of college work. Within the Department of Zoology he was a friendly counselor and took a deep personal interest in all activities of the staff. He served the department as Chairman of the Executive Committee, 1936-38, and was acting head 1938-39.

In addition to his university duties he had many outside affiliations. He worked with the Puget Sound Marine Station (1916), U. S. Bureau of Fisheries (1919 & 1921), Roosevelt Wildlife Experiment Station (1929-34), Cold Springs Harbor Biological

Laboratory (1936), and Isle of Shoals Laboratory (1939). He was a member and officer of many scientific societies, including the A.A.A.S. and was vice-president of Section F in 1939; the American Microscopical Society, the American Society of Parasitologists, the Illinois Academy of Science, in all of which he was President. He was also affiliated with Phi Beta Kappa, Phi Delta Pi, Phi Sigma, Gamma Alpha, Alpha Kappa Lambda and Sigma Xi. At the time of his death he was national president of Phi Sigma honorary biological society.

Apart from all his professional activities, Dr. Van Cleave found time for relaxation in a few special hobbies including the collection of stamps and coins, and old guns made by the firm of Ethan Allen. He had a fine collec-

tion of these Ethan Allen guns and had prepared a manuscript of book length dealing with them.

Two years ago Professor Van Cleave became seriously ill and was forced to undergo several operations. He had just begun a monograph on the Acanthocephala of North American Mammals as one of a series of projected monographs on the Acanthocephala. His work was constantly interrupted by periods of illness but was carried to completion shortly before his death. His last days were saddened by the death of his daughter, Dorothy Van Cleave Lincicome, who had been seriously injured in an automobile accident the year previously. He is survived by his wife Bernice, his son Philip and four grandchildren.

ON RETIREES

By A. S. Pearse
Duke University

Most universities require a professor to retire and become inactive academically at the age of 65 or 70. The question is then, how shall the retiree spend his time? Shall he just rest, listen to his radio, go to movies, travel for pleasure, attend athletic contest; or, may he continue to work, read, think, and write? Perhaps his eyes and ears have become stale. He may become steadily more incompetent because he gets little exercise. The writer attempted to prevent this last type of decadence by chasing snails in the Duke Forest and spent months seeking parasites along the coasts of North Carolina, the Bahama Islands,

Florida, and Texas. Much time had to be spent looking through a microscope, drawing, reading, and writing. I got tired. In order to get some insight into the types of lives great zoologists had lived a brief study of two was made. I wondered if Darwin and Wallace had "retired".

Darwin was born in 1809 and lived for 72 years. A college course, after a false start, finally fitted him for a career as a clergyman. However, he had always had an interest in geology and natural history, and, at the age of 22 years, he took an opportunity to sail as naturalist on the *S. S. Beagle*. So, he spent five years (1831-

1836), without compensation except his "keep". He was seasick practically every time the vessel was at sea. This left him a semiinvalid. He was troubled with indigestion and nausea all the rest of his life. When he got back to England he went back to his home and then spent most of his time studying, observing, thinking, and writing. He published many notable works, among which may be mentioned:— the Structure of Coral Reefs (1842), a Monograph of the Cirripedia (1851), the Origin of Species (1859), Animals and Plants under Domestication (1868), the Descent of Man (1871), Insectivorous Plants (1875), and, a year before he died, a work on earthworms (1881). Darwin was no quitter. He is mentioned with Aristotle, Cuvier, and Linnaeus as a leading contributor to biological thought and theory.

Wallace (1823-1913) was somewhat younger than Darwin and a copropounder (1859) of the theory of Natural Selection. His first publications (1853), on travel and the palm trees in Brazil, he published at the age of thirty. Some of his other works were on the Malay Archipelago (1869), the Geographic Distribution of Animals (1876), Tropical Nature (1878), Island Life (1880), Darwinism (1889), and Natural Selection and Tropical Nature (1891). The year he died (1913) he got out two papers on social environment and democracy. Though his health was then poor and he could walk little, he was still attempting to hybridize the plants in his garden. At ninety years he was not inactive. Perhaps his nicest characteristic was his unselfishness. Though he might have rused into print and "beaten" Dar-

win to the Theory of Natural Selection, he instead sent Darwin a copy of his manuscript and thereafter always cited Darwin as the originator of the theory.

There are perhaps three types of biologists. There are bright and lazy persons who see faults in all that others do, and are often pleased to point these out. These do not themselves "produce". This is for some bright spirits because they never get things perfect enough for production. For others because, being bright, they do not have to expend much effort to hold their own in society and hence lead an easy life. There are those of limited ability and intellect who spend their lives on details. These may be good and honest teachers and investigators. Then, there are a few who are willing to work on the development of new and better things. These contribute new facts and theories.

The greatest biological sin is to quit—to say, "I have done enough". Biology shouts, "Struggle and improve". Success is beating someone or improving on what someone else has done, not necessarily in an unfriendly spirit. This applies at all ages. Darwin and Wallace never quit working. Edison was a sick man for several years before he died, but continued to invent. Father Wasmann, blind, turned out notable works on ants. Pasteur, though physically handicapped, "produced" to the end of his life. Modern civilization consists for many in wearing proper clothes, reading of rapes and murders in newspapers, drinking coffee and cocktails, and smoking cigarettes. Success depends on self-control (i.e., going without certain things), work, and careful thought. As retirees, let's work!

CONSERVATION

By Stanley A. Cain

*Department of Conservation, School of Natural Resources
University of Michigan*

**Phi Sigma National Convention, St.
Louis, 28 December, 1952.**

It is likely that each generation considers itself to be living in a special age of great significance for the flow of history. For the individual, of course, this is not egotism, but simple pertinence; while for the species the present has a more relative significance. I shall proceed, therefore, in the typical pattern and as an individual run the risk of exaggeration of the significance of the present for the species.

It seems to me that man is presently on the steep upward slope of a series of rate changes that are, if not new in the history of man, at least different in magnitude. Curves representing these changes all have about the same shape when plotted against time. They are something like the shape of skis. There is a long period of time with little or no change, like the flat tread of the ski, followed by a sharp upturn, like the toe of the ski. The flat or gently sloping interval represents most of time that is significant for social man, and the sudden upswing spans little more than the brief two centuries of the industrial revolution.

It is true, of course, that there have been earlier revolutions than the industrial, such as the expansions of population and condition of life that accompanied the use of fire, the domestication of animals, the development of agriculture, the invention of tools based on bone or stone, bronze and iron.

The changes, the rate changes, to which I refer, however, seem to me to be of a different order of magnitude and significance for man, in the same

sense that the atomic and hydrogen bombs are of a different order of magnitude, and not just other new weapons. What are these phenomena? I shall not take the time to develop any one of them in detail, for they are all familiar enough.

There is the matter of population growth. The United Nations estimates the present world population to be about 2.4 billion, growing at the approximate rate of 1 per cent per annum. Such a rate, if continued, would double the world's population in 70 years. It means 24 million additional people a year - excess of births over deaths - and about 66,000 additional mouths to feed every day. At this rate, 10 years increment is as many people as are estimated to have occupied the earth at the beginning of the Christian Era. There are many factors operative in the recent rapid growth of human population, which, of course, is not uniform over the globe. In essence they are the factors that have increased sustenance for man, and the factors that have affected his longevity. As fast as the upswing in population has been during the last two centuries, the conditions are now ripe for an absolute population increase that will not only be greater than that experienced in the nineteenth and twentieth centuries, but will accrue faster. Man has new technical means of attack on the mass diseases. But he has a complacency, a sort of horn-of-plenty philosophy, about his capacity to increase the production of food and other necessary

and desirable products that has only locally demonstrated its validity.

The rapid increase of population growth is, of course, a reflection of certain technological advances - in agriculture, in public health, in labor-saving devices. The expansion of technology, based on science, on a more adequate understanding of the fundamental phenomena of the world, is itself showing a rate-change curve of the "ski type." Gadgets proliferate like guinea pigs. The need for food is a relatively constant thing - a person can eat only so much - but an individual's capacity to use energy and materials in a highly industrialized society is apparently limitless. So one finds similar curves for the increased use of energy, at least for the western industrialized culture, and for the consumption of materials. The use curves for petroleum, gas, coal, ferrous and non-ferrous metals, for plastics, etc., all show a strong family resemblance. The spurt in technological advance that got under way with the internal combustion engine, the discovery of the bacterial cause of some diseases and the nutritional causes of others, gained a great impetus around the turn of the century with the new insight into the nature of matter and energy. One thinks of Planck's quantum theory and Einstein's relativity, Thomson's discovery of the electron and Rutherford's of the nucleus of the atom, x-rays by Rontgen, radioactivity by Becquerel. Rapid progress in the use of electricity - radio, radar, television, the whole new field of electronics - speeds up technological advance and creates profound social changes.

With the ever-increasing advances in technology, man's capacity for modification of his environment, for depletion of resources, grows swiftly. Yesterday's novelties become today's psychological necessities. As some quip maker has inverted the old saying, "Invention is the mother of necessity."

There is an equally and consequently rapid exhaustion of space. There are no longer any far corners of the earth in the old meaning of the expression. All men have become neighbors, and with the fact there is a growing consciousness of terrifying international problems. For some men of good will there is a correlative response in social concepts of cooperation, but for others, often also men of good will, there is a frightened and sometimes necessitous retreat into nationalism. One can hope that man's increased capacity to modify the environment will be accompanied by an increased awareness of his role, *ex post* and *ex ante*, and a willingness great enough to match his capacity to approach a satisfactory ecological state.

One of the great areas of contemporary concern is that labeled conservation. This is an elusive term, and some common beliefs about conservation are illusory. I believe that conservation is a conscious effort toward an ecologically harmonious state for man. Such a statement, however, although novel, has similar semantic difficulties to the familiar interpretations of conservation as "wise use of resources," or "the greatest use to the greatest number over the greatest length of time." Such definitions of conservation merely add to the existing confusion. Conservation is not just the science of human ecology, in the sense of a study of man's understanding of his relations with his natural environment, nor is it the sciences and technologies of resource use; it is a conscious effort toward "an ecologically harmonious state for man." And so you ask, quite properly, What does that mean? It is certainly not just a matter of resource use, although some people, reacting to the idea that conservation is non-use, have swung to the other extreme and labeled any use of resources as conservation. So I must say a word about what I mean by "an ecological-

ly harmonious state for man."

You are probably thinking that this ecologically harmonious state is a sort of climax condition - a self-perpetuating and relatively permanent state something like the dynamic equilibrium of climax vegetation such as beech-maple forest, tall-grass prairie, or desert brushland. This is in fact very much the conservation concept of sustained yield made popular by foresters; but one can't define conservation as keeping resource use at a constant rate, for it has no meaning for nonrenewable resources, which are inevitably depleted by use, and would exclude modifications of use rates for the renewable resources. According to Ciriacy-Wantrup, conservation is a redistribution of resource use in the direction of the future and always implies comparison of two or more time distributions of use. Conservation, then, differs from depletion use in that the latter is directed toward the present rather than the future. From the point of view of capital, conservation can involve capital accumulation and maintenance or slowing of impairment of initial capital.

But man is a different "breed of cats" from other species, and industrial man is a new taxon as yet not well understood. His present ecological role is not that of a climax species, but is rather that of a highly dynamic one rapidly modifying its environment and somewhere in an ecological succession the termination of which is obscure.

A biologist of ecological slant who has found the problems of plant and animal species and their natural communities more than sufficiently complex and baffling, is likely to be distressed and very humble in the face of the problems of human ecology, for man is in many ways the contrariest of all organisms.

The conservationist finds himself uncomfortable when faced by the prevailing interpretations of a spirally expanding economy, because he feels

that the world is, after all, finite and the demands of the species are essentially infinite. While feeling that the economists should know what they are talking about, he wonders whether their optimism for the future is justified by man's brief experience with "progress," that magic concept of the West for which the Greeks had no word. True it is that Western man, while experiencing a population growth never before known by the species, has been able to keep production to a faster rate and has, consequently, enjoyed a rapidly augmented level of living. These phenomena argue for the benefits of a spirally expanding economy; but the experience is, as I have already said, a new one, and, furthermore, has been enjoyed by only a small proportion of the human race. But this is an attractive concept and people everywhere would like, and are going to do what they can, to have a better life. What then of the capacity of the world's resources to support an ever expanding population on an ever expanding scale of living? According to the Paley Commission report, it would take more than six times the present world materials production to bring the people of the world into the industrial way of life. If that were accomplishable, what then of the drain on fossil fuels and on minerals in short supply and on the biological productivity of the earth's soils? Long before any important resource is exhausted progressive depletion will produce profound changes in economy and, I would guess, in social and political affairs.

When any question is raised of the approaching exhaustion of a resource the optimists always point to the inexhaustibility of man's resourcefulness. It is true, of course, that resources are man's own doing. Except for the most primitive state in which man's ecology is little different in principle from that of any other organism, when the human group and the deer herd are es-

entially comparable, man's resources are of his own contriving, resulting from the interaction between the natural and man's culture. Since man creates, in this sense, his own resources, what is there to fear from the exhaustion of any presently known resource? When petroleum is gone, man will get the present petroleum products from coal, and when the coal is gone he will grow them in the forests and fields. Sources will replace one another and substances will substitute for one another. Once again, it is not possible to say that it won't be so, but it is possible to be cautious, to take only conscious and calculated risks, and to distribute recourse use in the direction of the future. That is the conservation viewpoint.

Since man participates in his own evolution, since he believes that he has and probably does have the capacity to direct within limits the course of his social development, man can face these problems with an appropriate time reference. He is not, however, the creator of natural laws. Somehow, sometime, man must grow out of his psychology of conquering nature and must learn how to cooperate with nature. Then he will approach an ecologically harmonious state. This brings me to my last point. The role of conservation in solving man's paramount problems is not one that will be played only by persons who consider themselves to be conservationists, as other persons are ministers, economists, lawyers, or carpenters, but is a role that must be played by all of us.

As I see it, a three-parted and interdependent system is necessary for the solution of the problems that confront the world with technical and ethical dilemmas. These three phases are the search for knowledge, the application of knowledge, and the acceptance of knowledge.

The search for knowledge is often called research. When it is called "pure research" it concerns itself with fundamental and basic knowledge about the

nature of the world and man. The application of knowledge is usually the province of the technologists, the engineers, who translate fundamental knowledge into working machines and working relations. Finally there is the laity, the public, who must accept the knowledge, whether it be an application of mechanics, heat, sound, electricity or light in some labor-saving device that makes life more comfortable and rich or an application of physiology or psychology that makes life more healthy or socially and politically better adjusted. These are the three: the people who think and discover, the people who invent, and the people who use.

Now, if we return in conclusion to the problems in which conservation is important we are confronted with technical and ethical dilemmas of modern society. "For of what use is science if man does not survive?" They are the problems posed by the world's large and rapidly growing population with ever increasing capacity to consume more and more of the physical substance of the environment, which means a greater and greater charge on natural resources, and increased risk of over-use. If these problems are to be met men must not be distracted from the real issues and new idols must not be substituted for old ones. If his ethics will not permit him to take evil means to good ends, he must beware of inadvertently doing evil though his intentions are good.

Science, and especially technology, come pretty close to being a modern-day idolatry. There are high warrants for our faith, but machines are for man and not the reverse. The basic problems - even in our vaunted Western technological democracies are still mainly human problems. There are the problems of man and machines and there are the problems of man and his natural physical environment, but man's harmonious ecological balance will also have to include better solutions of man's relations to man - the

political, social and economic problems of a diminished earth.

Since I commenced these remarks by admitting the risk of a personal bias, I may as well conclude by passing some personal judgments. In the United States today technology is riding high. Look about you in your universities and in the great laboratories of industry and you will see that our society has accepted the role that is to be played by technology. This, however, is largely in the field of the material arts and most of our institutions are giving only minor support to the societal arts.

The first of the trinity, the search for fundamental knowledge, is a sort of poor relation. We feel kindly toward poor relations, but we are a little embarrassed by them. We don't know

quite how to explain their sterling character to the neighbors when obviously they can't make a living. This, of course, ties in with the public, the laity, who must accept the truth. These people, the vast majority of us, are neglected and uncultivated except as we are to be sold the fruits of technology, whether by commercial advertising or such devices as agricultural extension.

I would not recommend that we reduce one whit society's support of technology. I do think, however, that ways and means must be found to support more adequately the search for basic truth in all fields of human relations, and above all, new ways must be discovered to develop and extend the public's sympathetic approbation for these findings.

SINISTER NEW ROLE FOUND FOR SNAIL

Special to The New York Times
ANN ARBOR, Mich., Dec. 5—In the United States a snail is the school-boy's symbol of slow motion. In France, a snail is something to eat. In Egypt, according to Prof. Henry van der Schalie of the University of Michigan, it is the carrier of a dread disease — bilharziasis.

Professor van der Schalie, curator of mollusks at the University, has just returned from a year along the Nile as head of a team of the United Nations World Health Organization scientists which has been making a start on eradicating the disease and the snails along Egyptian waterways.

The World Health group is making a two-pronged drive on the disease. It is treating the individual and it is treating the water with a copper sulphate solution to kill the host snails. Professor van der Schalie, who is directing the work from Ann Arbor, returns to Egypt in May to check on the results of the first year's campaign.

PERSONALITIES

Chicago, Ill., Nov. 00 (Special)—Elizabeth Ann Gibson of Big Runn, Pa., a member of Phi Sigma, is attending the University of Paris, France, as a Rotary Foundation Fellow for 1953-54. One of 101 young college graduates from 32 countries to receive a grant this year from the world-wide service club organization, she is studying biology in preparation for a career in experimental biology.

The Rotary Club of Punxsutawney, Pa., recommended her for the Fellowship.

Miss Gibson received the B.S. degree in June from Bucknell University in Lewisburg, Pennsylvania. She was President of the Phi Sigma chapter there, and served for two years as a laboratory assistant in zoology. She was a member of the Women's Student Government Association, the staff of the school yearbook, and was active in the Delta Delta Delta social sorority.

PHILIP HENRY GOSSE

By David Causey
University of Arkansas

III His Books

P. H. Gosse wrote many books, several of two volumes each. My list includes 39 titles, and I think is complete. The Gosse books, with the exception of the rotifer volumes, are not expensive. An inquiry to a second hand book dealer will probably bring a list of from 6 to 12, and at prices averaging a dollar a volume. To judge from markings and book plates in the twenty or so I have obtained thus far, many libraries and some schools are discarding them:

"I wonder often
what the vintners buy
One half so precious
as the stuff they sell."

In general I have paid little attention to the pot boilers put out for the Society for Promoting Christian Knowledge, and I have no knowledge whatever of the semireligious books he produced. The following discussion is limited to what I think are the better of his zoological writings, with a few quotations to illustrate either the nature of the book, the man, or his methods. His many technical papers are neither listed nor considered.

The Canadian Naturalist was the first volume, and the one which decided his career to a great extent. It is quaintly written about backwoods Canada, and gives a fresh and vigorous picture of those brave young days, showing clearly the enthusiasm and the Darwinian gift of observation, characteristics which Gosse retained the rest of his long life. The Father and Son dialogue form must have

been patterned after the religious tracts of his day, a stilted form of presenting the material. The book is worth knowing. It is interesting to note that the young Gosse was not so case-hardened spiritually as he became later on in life, he refers to the organisms "prior to the Adamic creation" (pp. 17-18), to his opinion that "the Scriptures are not designed to teach us facts in natural history" (p. 64); even puns, "But let us see what Flora has to offer" (p. 287), and throughout shows the personal knowledge of his facts which make his writings valuable. It is a curious fact that so few zoologists write about animals as though they were personally acquainted with them!

Ignoring dates of publication, the next would be the *Letters from Alabama* (U. S.), chiefly relating to *Natural History*, which covers the time spent teaching in that state.

"You must not expect from me anything like a continuous narrative. 'Story! why, bless you, I have none to tell, Sir!' My observations are slight and disjointed! peeps through Nature's keyhole at her recondite mysteries, 'passages in the life of a spider;' — 'unpublished memoirs of a beetle;' — 'notes of the domestic economy of a fly;' — and you must take them for so much as they are worth." (p. 134).

He tells jokes (poor ones!), he makes shrewd observations of southern ways, and at one place makes a most delicate observation:

"Boisduval, in his beautiful "*His-*

torie et Iconographie des Lepidopteres de l' Amerique," has figured the Black-banded as the female of *Delia*, but in this he is mistaken, as I have caught *Delia* in circumstances which enable me to determine the male and female with precision" (footnote, p. 213). This from a man who, at the age of 72 began a detailed study of the reproductive clasping organs of the lepidoptera and in two years had monographed these important devices, aided by nearly 200 figures! His observations (p. 108) on types of students are profound, and I wonder how he graded them.

The Birds of Jamaica and The Illustrations of the Birds of Jamaica established Gosse as a serious contender for scientific recognition, drawing praise from John Gould. *The Illustrations* met the only important criticism of *The Birds of Jamaica*. He drew these on stone, underestimated the cost, and took a loss on every copy which was sold. But, as Huck Finn remarked about another man, it taught him a lesson!

The Naturalist's Sojourn in Jamaica is a travel book, and so far as I can judge, people either like such books or they don't. Without being a classic like the *Voyage of the Beagle*, it is an interesting picture of the island a century ago, and much of the zoological information in it has not been replaced by newer studies. In it he expresses a painful situation still too true to be laughed away:

"Natural history is far too much a science of dead things; a *neurology*. It is mainly conversant with dry skins furred or feathered, blackened, shrivelled, and hay-stuffed; with objects, some admirably beautiful, some hideously ugly, impaled on pins, and arranged in rows in cork drawers; with uncouth forms, disgusting to sight and smell, bleached and shrunken, suspended by threads and immersed in spirit (in defiance of the aphorism, that "he who is born to be hanged will never be drowned") in glass bottles.

These distorted things are described; their scales, plates, feathers counted; their forms copied, all shrivelled and stiffened as they are; their colours, changed and modified by death or partial decay, carefully set down; their limbs, members, and organs measured, and the results recorded in thousandths of an inch; two names are given to every one; the whole is enveloped in a mystic cloud of Graeco-Latino-English phraseology (often barbaric enough); — and this is Natural History! (Preface)."

The book drew praise from Darwin and R. Owen. The latter said:

"His book, all about things I am so very fond of— birds and fishes, crocodiles and lizards, butterflies and crabs, both in and out of shells, to say nothing of sea and sunshine— has made me quite long for a holiday in Jamaica."

He should have tried for a Fulbright fellowship!

The popular sea shore books— *A Naturalists' Rambles on the Devonshire Coast, Tenby: a Sea-side Holiday*, and *A Year at the Shore* — are delightful works, filled with his personal observations, often very acute, his little bits of archaic poetry, vignettes of the British coasts so rich in historical and natural wonders— the treasure trove of a skilled naturalist beachcomber. They should not be read in rapid succession or you may tire of Gosse as his public did. Read one at your usual pace to get the full flavor of his art and science, and keep the other two as sparetime tidbits.

"The difficulty of delineating with accuracy objects that can be defined only with microscopic powers would hardly be imagined by those who have never attempted it. In the case of this little fish, every glance at its form or colours, in order to transmit them to the paper, was taken through a triple pocket-lens, which had to be exchanged for the pencil at each stroke. The focus of this glass was about half an inch, but the fish was swimming free-

ly in a large glass jar five inches wide; so that it was only when it spontaneously approached close to the side of the transparent vessel, that I could get a sight . . . When it came, perhaps it would be with the wrong side presented towards me, or the part which I wanted would be turned to one side, or in some way altered from its former position . . ." (Devonshire Coast, p. 184).

"The Sweet-gale or Bog-myrtle was growing in great profusion, a lowly shrub, like a minute willow, but most fragrant, especially when the leaves are bruised; a beautiful emblem of the Christian who needs to be pounded in affliction's mortar, before the odour of his graces will flow out." (Tenby, p. 205).

"It is a matter of regret that so large a portion of our pictorial natural history represents death rather than life; while a herd of slavish competitors, who have never seen the creatures on which they obtrude their teachings, copy such imperfect figures, and copy each other, and go on augmenting the distortions, and straying farther and farther from nature, till all *vraisemblance* is lost in the ludicrous caricature." (Year at the Shore, p. 201).

Most of *The Aquariums: an unveiling of the Wonders of the Deep Sea* (a somewhat misleading title for littoral forms), is a seashore book like the preceding. The final chapter of directions for preparing, stocking, and maintaining an aquarium, along with Gosse's personal experiences—the what-to-do and the what-not-to-do, are interesting and still of value. His success with his artificial seawater was marked. He makes no claim to be the first, in fact strains himself to show that others were ahead of him, but he appears to have been the first to provide aquaria on a scale large enough to interest the general public. My second edition has bound in it Mr. Lloyd's little 4-page sale list, and I note that great a variety of sea anemones, hydroids, starfish and sea ur-

chins, sea cucumbers, tube worms, crustacea, polychaeta, mollusks, and fish are available from 6d to 2s. Barnacles are listed separately—J. Vaughan Thompson and Darwin had labored in vain so far as Mr. Lloyd and his customers are concerned.

Two other books dealing with marine forms must be mentioned. *The Actinologica Britannica* has only recently been replaced by newer monographic treatment of the sea anemones Gosse loved, second perhaps to the rotifers. You don't have to read the text—just look at the plates of the anemones, which Edmund says are poorly reproduced from his father's originals, to see the beauty not discoverable in the awful formalin-pickled messes we hand our students. *The Manual of Marine Zoology* in two small volumes was written to meet a need he had experienced in his own studies, and, no doubt, in his seashore classes. His preface to Part I discusses this fully. And he there also discusses a fault still evident in taxonomic works:

"Knowing by experience the difficulties which lie in the way of identifying animals by published characters, I have laboured to remove, or to lessen those difficulties as far as was possible. I have endeavoured to make these pages practically useful to the beginner, while yet they should be precise enough to serve the advanced zoologist as a convenient medium of reference. Many of the difficulties in the path of science are not inseparable from it; the language used is often unnecessarily technical, and yet, strange to say, loose withal. Thus we sometimes find one species described as having "the fore limbs short," and the next, which is to be distinguished from it, not as having "the fore limbs long," but "the anterior extremities elongated." Sometimes in the long descriptions which must be waded through, and carried in mind, the head in one case is mentioned first, then the tail, then the trunk, the limbs, and so

on: but in the succeeding example, which has to be compared with it, perhaps the limbs come first, then the trunk, etc. Such difficulties as these are most perplexing; and yet it is easy to see that a little care might entirely remove them. If a certain order were maintained in the details of description of kindred forms, and a fixed phraseology, I need not point out how much the work of comparison would be lightened." (Preface, Pt. I. viii-ix).

My little set (which cost one dollar for the two volumes!) is in constant use. As one reads the works of the zoologist of the last century and unfamiliar names of animals or strange taxonomic terms appear, it is easy to turn to Gosse and find them. And the differences in classification serve to emphasize the progress in the understanding of animal relations which has been made in that time.

Omphalos has been discussed in an earlier section of this study. My copy, in the original binding, bears the cover title of Gosse's *Creation, Illustrated*, but the title page has the conventional title. Reference to the *Rotifera* has been made earlier, and of all Gosse's works this one should require the least review. If any reader is not familiar with it I both pity his ignorance and envy him the thrill he will get from it—just looking at the illustrations. The two volumes of *The Romance of Natural History* are largely compilations from his little articles in various popular publications, short, uncritical, Sunday-School-paperish stuff I disliked as a child and now, in my second childhood, I still don't think them worth the time it takes to read them. Apparently they were very popular in their day, but so was *Tom Jones*. The *Popular British Ornithology* is no doubt dated and out of date by now, but it must have gladdened the heart of many a young person of the day, and the colored plates must have, many times, answered that eternal question, "What bird is that?,"

which Mr. Reed and Mr. Peterson are trying to answer for us today.

A superb feature of Gosse's books are the illustrations. In his *Manual of Marine Zoology* he mentions having made about 3,000 figures of animals or their parts, all drawn from life. This was increased to about 5,000 by the end of his life, perhaps half of which were of microscopic organisms or parts. Many of these are in colors—*A Year at the Shore* has 36 plates in colors! Most of the plates were prepared by making life studies of the animals and then these little gems were pasted onto a suitable background, say a bit of the seashore or a portion of a tide pool. Crowded though they are, and slightly artificial in the sense of being placed to yield the maximum illustration in the space available, they are the best substitute for the living animals I know of.

In conclusion, may I express the hope that this study of Philip Henry Gosse takes the reader to some of his books. Peculiar, bigoted, touchy and jealous of credit for his work, tragically lonely and curiously warped in his personality and viewpoints, sincerely truthful in reporting what he said or thought, a scholar in a way and a real scientist, a Fabre in his patient observation of detail—he is a man worth knowing.

Books by Philip Henry Gosse

- 1840 The Canadian Naturalist
- 1844 Introduction to Zoology, 2 vols.
- 1844 The Ocean
- 1845 Glimpses of the Wonderful
- 1847 The Monuments of Ancient Egypt and their Relation to the Word of God
- 1847 Birds of Jamaica
- 1848 Mammalia
- 1849 Illustrations of the Birds of Jamaica
- 1849 Birds
- 1849 Popular Ornithology of Britain
- 1850 Reptiles
- 1850 Handbook of Zoology

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| 1850 | Sacred Streams, or the Ancient and Modern History of the Streams of the Bible | 1857 | Omphalos, an Attmpt to Untie the Geological Knot |
| 1851 | A Naturalist's Sojourn in Jamaica | 1857 | Memorial of the Last Days on Earth of Emily Gosse |
| 1851 | Textbook of Zoology for Schools | 1859 | Evenings at the Microscope |
| 1851 | History of the Jews | 1859 | Letters from Alabama |
| 1851 | Fishes | 1860 | Actinologica Britannica |
| 1852 | Assyria, her Manners and Customs, Arts and Arms, Restored from the Monuments | 1860-61 | Romance of Natural History, 2 vols. |
| 1853 | A Naturalist's Rambles on the Devonshire Coast | 1865 | A Year at the Shore |
| 1854 | Molluscs | 1874 | The Wonders of the Deep or the Physical, Animal, Geological and Vegetable Curiosities of the Ocean (= The Ocean, under different title) |
| 1854 | The Aquarium | 1879 | Land and Sea |
| 1855 | Handbook of the Marine Aquarium | 1879 | The Great Atlas Moth of Asia |
| 1855-56 | A Manual of Marine Zoology, 2 vols. | 1884 | The Mysteries of God: a Series of Expositions of Holy Scripture |
| 1856 | Tenby | 1886 | The Rotifera (with C. T. Hudson), 2 vols. |
| 1857 | Kew Gardens | 1889 | The Rotifera, Supplement |
| 1857 | Life in Its Lower, Intermediate, and Higher Forms | | |

PUZZLES OF BIRD WATCHING

By Dr. R. A. Hefner

*Chairman of the Department of Zoology
Miami University, Oxford, O.*

To the novice in the practice of bird finding, the ways of the accomplished field observer are a source of open wonder and occasional skepticism.

How can anyone look at the gray outline of a small bird against the dull background of a gray sky and confidently announce that a particular specimen in a swaying treetop, sixty to eighty feet from the ground, is chickadee, a titmouse or kinglet? The answers to this challenge are hard to express in definite terms. Let us turn the questions on our inquirer and ask how he identifies a dozen of his friends and neighbors at a distance of half a block from his window, when all those persons are wearing dark or

gray coats on a dull, murky day? There are some variations in size and build, but mannerisms of gait and carriage are probably surer indices of identity. If some individuals among this dozen habitually walked in the gutter or the street, their separation from the more common sidewalk varieties would be further simplified.

When we apply this analogy to our problems of bird identification we discover that the two situations have much in common. We become accustomed to seeing a particular friend on a certain street or walk. In a like manner, the habitats of many birds are more or less specific. Birds vary greatly in size but even among species of equal size there are pronounced varia-

tions in body, tail and wing proportions. Even more distinctive are the mannerisms of the several species.

Chickadees and kinglets are near the same size and both are active feeders in treetops. The former grasp the ends of twigs and swing like the aerial gymnasts that they are as they seek the varied items of their food. The kinglets flutter about the limbs and twigs in their nervous feeding activities, scarcely alighting in their continuing search for hidden insects or their eggs.

As the chickadees extend their searches along the limbs and trunks of trees their feeding range meets that of the nuthatches. The more common white-breasted nuthatch is larger than a chickadee but his markings would be indistinguishable in a tall tree on a dull day. Again it is the behavior of the bird that identifies him for the informed bird student. Spending much time on the trunks of trees, the nuthatch moves up or down with equal ease and, of all this tree searching group, he is the only one that moves head first as he travels downward.

The rarer red-breasted nuthatch is between his white-breasted cousin and a chickadee in size. The tinge of red on the sides and the light line about the eye are not conspicuous in field observations, so mannerisms are again the most useful means of identification. Like the white-breasted, this smaller nuthatch moves up and down tree trunks with ease. He is less persistent in his searches and spirals about the limb of one tree, shuttles in and out of a fork of another, and makes a short survey of a third while the more methodical white-breasted is giving one small tree a thorough gleaning. The distinctive calls of these birds are often sounded as they move about, but a silent feeder announces his identity just as readily to one who has trained the eye as well as the ear.

The brown creeper is another searcher of the tree-trunks with a feeding range that overlaps the territory

of the nuthatches. The creeper is a brown-gray bird whose color markings are arranged in longitudinal stripes which give a beautiful blending with the bark of a tree. This bird is distinguished from the nuthatch not only by appearance but also by its method of feeding. The creeper begins at the base of a tree trunk and moves upward by short hops as he searches the bark for insect food. When the limbs of the trees are reached in the upward-spiraling search, the creeper deserts this tree and flies to the base of another to repeat his upward-progressing quest.

In appearance the creeper could readily be mistaken for the black and white warbler, whose colors are likewise arranged in stripes. The dark colors of this warbler are deeper than the browns of the creeper, and the intermediate stripes are lighter than the gray of the creeper's coloration. The habits of these two birds are very similar. The warbler also feeds on tree trunks, but he is not so persistent in moving upward during the course of his feeding search. The chief factor that separates the brown creeper from the black and white warbler for the bird student is the calendar. In our territory the brown creeper remains with us until late April or early May before starting the migration which carries him into a more northerly nesting area. The black and white warbler appears in our region during the middle or the late part of the month of May. In years of bird observing, I have never seen the brown creeper and the black and white warbler within the same week.

So many factors are employed by the habitual field observer of birds that the average person does not attempt to analyze the bases for his observations. He employs the eye, the ear, and the factor of the season in this ever challenging problem of identification and interpretation of the ways of the aerial wilderness.

BIOLOGICAL SCIENCE TELEVISION*

By Karl F. Lagler

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In the middle of this the twentieth century, teaching and research biologists are challenged with new horizons and horizon-widening tools unenvisioned only half a lifetime ago. Many of the challenges and their associated opportunities emanate from the discovery of antibiotics, creation of the electron microscope, applications of knowledge of radioactivity, and the rise and spread of television. With the facilities provided by each of these things we are able to study structure better, to learn more about function and its regulation, and finally to impart broader information and deeper understanding to mankind than has been possible heretofore. The accelerating effect of such teaching on future growth in biological knowledge is inestimable.

Consider the basic areas in which the study of plants and animals (including man) has grown to the present: *Morphology* — gross and microscopic structure and embryonic development; *Physiology* — function, action; *Natural History, Ecology, Geographic Distribution and Conservation* — life ways and interaction of organism and environment; *Classification, Genetics and Evolution* — differentiation of the many plants and animals and transmission and change of characters. Also, consider, please, the great contributions of Physics, Chemistry, Geology, Mathematics, Psychology, Sociology and other sciences to growth in knowledge of the previously listed areas. Then envision the potential for new growth in the basic areas of the biological sciences engendered in the advances of the last decade.

Antibiotics help prolong life and condition, not only of man, but of domestic and experimental animals as well. By using antibiotics in culture media, for example, we can now rear some organisms or life-history stages for study that we had not been able to handle successfully before (*e. g.*, eggs of some fishes).

The *electron microscope* enables inspection, photography, and analysis of objects invisible in optical microscopes. The benefits to study in the fields of virology, cellular physiology, and genetics by use of the electron instrument are tremendous.

The appearance of *radiobiology* as a discrete field of biology is associated with new, accurate ways of dating life periods of plants and the animals which lived thousands of years ago. The experimental use of radioactive isotopes of chemicals concerned with life processes has made and is making possible the investigation of the routes, destination and value of many substances important to life. It has also made possible new analyses of the actions of bodily organs (*e. g.*, clinical appraisal of thyroid function by iodine-isotope dosage). The utility of radioactive materials is not limited only to analysis of vital processes in living organisms but is also applicable to investigations of the metabolism of lakes and streams, the course of underground waters, and the rate of petroleum formation from

*Paper presented at Metropolitan Detroit Science Club Mid-Winter Institute: SCIENCE EDUCATION IN THE ATOMIC AGE, Jan. 31, 1953. Contribution from the School of Natural Resources, University of Michigan.

organic sources.

Television (and other electronic instruments) give man eyes and ears in places largely unexplored before. With these devices he can see and hear in the greatest depths of the ocean or remotest crevasses of the earth. He can observe life and study behavior in such inaccessible places almost as readily as in his own laboratory. And finally, with television and radio combined the biologist can impart his information *and its intimate features* to more people than ever before. Just how may he do this or how is he doing it?

First of all, in his training the biologist must now master more of the physical sciences than ever before. He is also faced with a greater need than ever to develop skill in expository writing and in public speaking. If he contemplates a career in teaching he must also gain basic training in psychology and acquire fundamental tools from the field of education.

The trained, active scientist commands material of high potential for arresting audience interest (Poole, 1950). This is perhaps most characteristic of a biologist because his subject is often man himself. Thus we see in eighteen college courses offered by television in the University of Michigan from 1950 through 1953 that ten have been scientific, and of these, six were biological: human biology, food and nutrition, growth and development, aging, behavior, and ecology (*i. e.*, natural resources).

Through the medium of science-television, biology can provide at least three great instructional services: (1) basic, formal courses; (2) training in areas supplementary to current basic and formal courses; and (3), general and popular education. The vehicle for these services is already well established in commercial stations and in the currently productive channels of some 90 colleges and 65 public school systems, —twice the number which were active in 1951 (Dunham,

1951).

Some basic, formal courses can now be taken by television for credit toward graduation from schools or colleges. Western Reserve University, for example, currently offers such opportunities at the collegiate level. The Baltimore public school system serviced its students at home for an interval in January, 1953, with reportedly good results for a wide range of grades and subject matter.

Many courses are now offered by television to extend the previous educational experiences of adults in a formal way. Some public school systems have adopted this procedure as have many institutions of higher learning, among them the University of Michigan. At this University, the home student pays a fee to take a course by television (Lagler, 1951). The charge is token payment for materials mailed to him in conjunction with weekly televised lessons. The use of the "eyes" of the television camera in surgical training, particularly at the post-graduate level, has been featured several times in the last three years (*e. g.*, Dunham, 1951a). By the means employed, viewers who may study critically the details of delicate operative procedures are made almost infinite in number and in geographical distribution.

Instruction in biology, supplementary to current classroom offerings, is also possible by television as shown by current, growing practice in the Detroit Public School system, for example. This may take the form of closed-circuit broadcasting of select films, live-demonstrations, or lectures by outstanding scholars. Student experience is constantly enriched when face and gestures, let alone visual aids, of a guest lecturer are received. In these roles television may increase the efficiency of use for films and demonstration materials and may constitute an economical and practical substitute for costly auditoriums.

It is even to be hoped that inexpen-

sive, self-contained, portable television units may become available for use in classroom demonstrations. In histology, for example, currently available microprojectors sorely limit the kinds of material which may be studied, the quality of the image obtainable, and the number of viewers. Television offers a yet undeveloped means for eliminating these difficulties.

General and popular education by television affords the biologist great opportunities for public service as well as for professional gain. Perhaps the offerings will be broadly cultural, enhancing man's understanding of himself and his world. Or, they may help man in personal adjustment or the maintenance of personal health. I should like to feel, however, that in addition to public benefits, biologists will benefit from their efforts in this

direction. It should follow that the greater the public appreciation of the work of the biologist, the greater the support for teaching and research in the biological sciences.

Biological-science television, then, has a many-sided educational role. However, all of its applications are doubtless not of equal pedagogical value. I have made a preliminary, subjective rating of instructional uses of television in the schoolroom and at home in comparison to ordinary classroom procedure (Table 1). The straight lecture is judged to be most effective in the classroom, of intermediate value when television brings the speaker to the schoolroom, and of least value at home. For a straight lecture, school or home use of television has only small value over radio.

TABLE 1
TENTATIVE, COMPARATIVE RATING OF INSTRUCTIONAL
APPLICATIONS OF TELEVISION IN TEACHING BIOLOGY

Teaching device	As ordinarily conducted in classroom	Using T-V in classroom	T-V at home
Straight lecture	Good	Fair	Poor
Lecture plus visual aids	Best	Good to best	Good
Demonstration plus descriptive monologue	Good	Best	Good to best
Laboratory	Best	Good	Poor
Discussion	Best	Good to best	Poor
Assignments	Good	Good	Poor
Testing	Good	Good	Poor
Instructor	Fair	Good	Good

When visual aids, such as maps, charts, slides, chalk diagrams, are added to the lecture technique (see, Speece, *et al.*, 1951), television may be as good in the classroom as the similar routine by direct instructor contact. At home, this type of presentation surpasses anything that is possible by radio alone.

If, now, we employ demonstration as the teaching means and use experiments, procedures or dissections with a descriptive monologue, I feel that in general more can be taught at home and in the classroom with television as an aid than can be done in a classroom by ordinary procedures. The most advantageous feature is the greater detail which can be shown to more individuals by television than by any other means.

Laboratory work involving actual practical experience on the part of the student will be served best in properly equipped classrooms. Discussion, too, requires the classroom presence of an instructor for greatest effectiveness. Yet, televised materials can be used as a basis for such discussional procedure. Often a better foundation for discussion may be provided by television (such as operative demonstrations) than by any other means.

Making assignments and encouraging students to fulfill them are best achieved in the conventional classroom. The same is true of testing for review and achievement.

Regarding instructional quality,

pedagogy on television is likely to rate higher than that in the ordinary classroom. For one thing, instructors for television are more carefully chosen than ordinary ones. In addition, the tight scheduling of television lessons eliminates digressions from the subject matter! And finally, careful consideration of visual materials is forced.

In summary, it seems to me that ordinary classroom teaching may indeed improve its effectiveness in demonstrations and in basic pedagogy (*e. g.*, Dunham, 1951 a), by employing television as an adjunct, quite as observed by other writers. For teaching biology at home, television far surpasses radio but cannot approach the value of a program that brings the student to the classroom for at least part of his experience.

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The student organ of Allegheny College reports this flash of genius in a biology quiz. "When do the leaves begin to turn?" read the question. And this answer sparkled back, "At the same time as the midnight oil begins to burn, the night before exams."—*Barometer*.

PUTTING CARTS BEFORE HORSES

By Anselm M. Keefe, Ph.D.
Editor of the Biologist

As the chill of the average winter begins to settle down, and the Christmas litter has become a thing of the past, every good gardner gets the catalog fever and begins to dream dreams about the seeds, bulbs, plants, shrubs, maybe even trees, he'd like to buy for the further improvement of his home grounds, or the enrichment of his family table. In this yearning to get back to the soil of Mother Earth, your amateur gardner is not alone. Every other outdoor man gets the same urge. Shortly after the barriers of ice and snow obliterate the features of the landscape, your golfer and your fisherman succumb to the atavistic urge to get back to the good earth again.

Your amateur gardner, let's call him Urban Suburbus, has no time for extended trips to golf links or trout streams, nor money for club fees or fishing rods, reels, flies, and all the rest of the gear needed by every true son of old Ike Walton. His is the more modest ambition to pit his abilities and energy against the soil, the weather, the growing plant, and all manner of things that crawl or creep, or hop, or fly, or burrow, including all the children in the neighborhood. While his financial outlay for the indulging of his hobby is not that of the sportsman, in the long run it may be considerable. Even if one omits the capital outlay in the purchase of seeds or living things to put into the ground, - - - and poisons to kill off the uninvited guests intent on their destruction, - - - there can still be a considerable amount of modest expen-

diture in beginning or maintaining a garden. Tools cost a-plenty, and there are few men, or women, gardners who can resist the appeal of new and labor-saving (?) gadgets. In this the parallel with the golfers and the fishermen runs true to form.

When the budding amateur has developed into a more mature specimen, the need for certain garden luxuries like soil testing kits becomes more pressing. Taken all in all, the possession or acquisition of the fabled "Green Thumb" will ultimately be something more than financial chicken feed. Who gets a gardner's money? The nurserymen who supply the bulbs, plants, shrubs and trees; the seedsmen who supply the seeds; the gadget manufacturers who lie awake nights thinking up new and attractive tools; the purveyors of chemical or organic nutrients or fertilizers.

These are the very people who seem to be engaged in putting carts before horses. They have become guilty of one of the weirdest pieces of inconsistency of our day and age. Fortunately for them, there are too few who know much about it. Hence it has gone unchallenged for years. Manifestly, the seed, bulb and nursery people are not in their respective businesses for their collective or individual health. Neither are the dealers in fertilizers, or soil-testing apparatus. Why then, don't they get their heads together in their own interest, - - - which in the long run will prove to be the best interests of our friend Mr. Urban Suburbus?

Like every other ambitious would-be gardner, Mr. Suburbus of the Green Thumb Neighborly, will ultimately be an asset or a liability to their trade. It all depends on his succss or his failure. And it isn't only the Orientals who give up when they "lose face" over a failure. Every disheartened gardner means just so many others who are going to be warned away from gardening as a healthful hobby, and who will look for less exacting recreations where there is at least a sporting chance for success.

Somebody is forgetting that the Urban Surburbuses are not all college graduates. A lot of them are self-made men, and everyone knows that lots of high school graduates still have difficulty spelling out the advertisements on television. It might be surprising if the truth were known, how far the average gardner depends on word-of-mouth encouragement, advice or information. The Green Thumb Neighborly starts operating over the backyard fence or on the suburban train into town. The Urban Surburbuses succumb very easily to the corporate examples and enthusiasms of their locality. Among them every small success is a major achievement. One tomato picked earlier, or one taller gladiolus than any one's else in the block is a chest-projecting triumph. Getting deeper into the game as the years go by gives rise to an enthusiasm that is generally infectious. And so newcomers to the neighborhood are inoculated with the same pleasant virus.

Conversely, a small series of disastrous experiences can change the would-be gardner into a disillusioned influence more of a wet-blanket than a carbon-dioxide discharge on a bonfire.

Let's take a very concrete example. Mrs. Urban Suburbus gets a bit of a financial windfall from an unexpected bequest. So to please Urban she maneuvers the trusty family car up to the biggest and best plant nursery in the neighborhood, and loads up, fore,

aft, and inside, with all the "perfectly lovely" shrubs and plants they used to grow on her ancestral estates in old Cape Cod. The lady meets no opposition from the nurseryman who takes her for one of the *cognoscenti*, and she returns home with andromeda, azalias, dogwood, Japanese Iris, sweet birch, holly, mountain laurel, magnolia, and rhododendron, all neatly balled and burlapped, and labelled. (We have yet to hear of a plant sales depot which offers free soil testing. It will come in time, like the free services of the interior decorator in the furniture and drapery shops.)

On his return home that night, Urban puts an appropriately surprised and pleased face on the matter, and volunteers to spend the week-end helping "mamma" get the "breath of old Cape Cod" safely into the ground. So they do. And to help things along, a generous handful of bone meal is mixed into the soil about the roots of each of the new plants. All the neighbors are green-eyed with jealousy, privately lamenting their own inexperienced choice of less opulent relations.

But the Suburbus plantation is singularly unappreciative and uncooperative. Its leaves yellow and fall, long before their appointed time. Urban and his good wife mulch and water and cover for the winter, but the looked-for "breath of old Cape Cod" never quite materializes, except perhaps in the spirited coddling of the neighbors. Any one of these same neighbors might have done exactly the same thing under like circumstances. For them to say: "Better luck next time," is poor consolation. For Urban and wife, "There ain't going to be no next time." He'll stick to tomatoes and she to glads, or maybe zinnias. Urban and his wife have lost face in the Green Thumb Neighborly. Who is to blame? Perhaps the Cape Cod plants, all of them native to acid soils. Neither Urban nor his neighbors knew that you can't grow very low pH plants in a very high pH soil. Urban's

lot had a PH of 7+ and his use of bone meal, which is a natural alkalizer, didn't help matters. Had his fertilizer been strongly acidifying, his plants might have lasted, some of them at least for a while.

Maybe this situation is overdrawn. Maybe not. It could easily have been avoided if Urban and Mrs. Urban and all the neighbors had long since become pH conscious. It wouldn't have happened if every seed, bulb, shrub and tree catalog-producer had long since made it a practice to note under each item its optimum soil pH. If that is too long-haired, maybe a compromise along the lines suggested by Dr. Edgar T. Wherry might have been adopted, and a single one-word term added to each write-up. (F. L. La Motte, W. R. Kenny & A. B. Reed, *pH and Its Practical Application*. Williams & Wilkins Co., Baltimore, 1932) Here they are as La Motte, Kenny and Reed give them:

Mediacid	4.0 — 5.0
Subacid	5.0 — 6.0
Minimacid	6.0 — 7.0
Circumneutral	6.0 — 8.0).

Of course, this would mean resetting of the bunged-up type in many an ancient flower or vegetable catalog "blurb." Maybe it is needed. Some of those descriptions have been in use unchanged since Grant was President. Someone used to say for every Munchausen in his acquaintance: "He lies like a seed catalog!"

Perhaps this is too much to expect. Perhaps the trade is making all the money it needs or wants. Perhaps nobody gives a hoot about the poor and luckless Suburbuses all over the country who might be getting such a whale of a lot more pleasure out of their little garden experiences. Perhaps it is better horticultural ethics to keep the traffic in seeds, bulbs, shrubs and trees moving, even though the locality to which they are shipped has a soil that is more inhospitable. (Such a project might develop into a boon for the

ecologists. It is just barely possible that it would increase our knowledge of plant-animal communities by stimulating interest in plant "indicators.")

What goes for the soil requirements of plants goes equally well for the many different nutrients and fertilizers which are coming onto the market in greater numbers and combinations every year.

It doesn't take a research chemist to make up and test 1% solutions of a given number of commercially marketed nutrients or fertilizers. Any smart high school student could do it with a minimum of instruction. The colors of the different solutions would form a veritable Joseph's coat, but the range of pH's would be just as varied.

A thoughtful dealer might possibly take steps to label his product plainly in large letters: "POISONOUS to acid-loving plants." Or vice versa.

All of which would seem to indicate that a little less high-pressured salesmanship and a little more brotherly appreciation for the problems of simple folks who, in their craving for domestic beauty, would like to garden as well as their more educated or wealthy neighbors, might in the end pay mutual dividends in common interest, enthusiasm, and ultimate willingness to buy.

Judging from some of the gorgeously elaborate literature sent out by the garden catering industries, the amounts involved in its production are not precisely meagre. It seems to some of us that this is putting the carts before the horses. Wouldn't it be better to be reasonably sure that the spectacularly figured plants would actually grow for Urban and his wife before they are allowed to purchase them? Heaven knows that they will have enough problems with the bugs and the weather and the aforesaid neighbor's children, not to say cats, dogs and birds, without further stacking the cards against them.

Maybe this is asking for Utopia.

NEW BOOKS

This section offers brief, mostly uncritical reports on the general content of recent publications in biological and related fields. Only the longer critical reviews will be signed. For quick location on library shelves, each notice will be preceded, wherever possible, by three groups of numbers, the first two of which will be the Dewey and the Library of Congress classified numbers respectively. The third group is the L.C. card number, for the convenience of Librarians.

AFRICAN VIOLET VARIETY LIST, by Carolyn K. Rector. Lane Publishing Co., Menlo Park, Calif., 1953. 76 pp., \$.50

Seventy-three pages of varieties, about twenty-five to thirty to a page! How bath our Afric Caesar grown so great! Fanciers of the Saint Paulias will want to have this comprehensive list.

THE ALGAE OF ILLINOIS, by Lewis H. Tiffany & Max Edwin Britton. The University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill., 1953. 407 pp., 108 pl. w/11-86 illus., \$10.00

589.3 QK571.T56 53-5822

This is another valuable reference manual on Middle Western phycological forms. It fits nicely between the more topical general texts and the more profoundly inclusive taxonomic studies. There is a five-page bibliography, and a seven-page glossary. The status of the authors in modern algology warrants the reliability of this production.

ALL ABOUT GUPPIES, by Leon F. Whitney. Garden City Books, Garden City, N. Y., 1952. 99 pp., 20 fig., 3 col. pl.

639.9 SH167.G9W5 53-17584

This little manual lives up to its title. It treats of the history of the guppy, *Lebistes reticularis*, their anatomy, the equipment needed to raise them, their food, inheritance, diseases, and exhibition in shows. There are seven pages of bibliography. As the first popular book about a very popu-

lar aquarium fish, one should conclude that this is "just what the doctor ordered."

AMERICAN POCKET MEDICAL DICTIONARY. W. B. Saunders Co., 218 West Washington Sq., Philadelphia, Pa., 1953. 639 pp., Plain \$3.25, Thumb - indexed \$3.75.

This is the 19th edition of a very hardy little colume in limp imitation leather covers. It covers the principal terms used in medicine, nursing, pharmacy, dentistry, veterinary science, and other related biological subjects. The original copy appeared fifty-five years ago. The simplicity with generosity that characterized its list of words is still an ideal the compilers and publishers maintain with success.

ANALYSIS OF THE SIPHONOUS CHLOROPHYCOPHYTA, by Lois E. Egerod. University of California Press, Berkeley, Calif., 1952. Vol. 25, No. 5, pp. 325-454, plates 29042, 23 fig. in text, \$1.50

A53-9025

One of the most controversial groups in the phylum of the siphonous green algae is here treated with special reference to the Siphonocladiales, Siphonales, and Dasycladales of Hawaii. Five new species and fifteen that are new to the Islands are here described.

ANATOMY OF THE NERVOUS SYSTEM, by Stephen W. Ransom, revised by Sam L. Clark. W. B. Saunders Co., 218 West Washington Sq., Philadelphia 5, Pa., 1953.

581 pp., 434 fig., \$8.50

This is the ninth edition of the original 1920 text which aims to blend structure and function in such a way that the student has no excuse if he does not understand both how the nervous system is made up and how it works. On this basis he should interpret functional abnormalities. The work of Penfield and his associates in their postoperative observations in the realm of memory and speech are of particular interest, since these are functions on which data can not be obtained in laboratory animal dissections. Pages 515 to 534 are devoted to a laboratory outline of neuroanatomy. There are twenty pages of bibliography.

ANTHROPOLOGY TODAY, by A.

L. Kroeber. The University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill., 1953. 966 pp., \$9.00
572.082 GN4.I52 53-6171

As its comprehensive title indicates, this monumental work is a symposium on the status today, by fifty-one of the world's leading anthropologists. Forty papers treat of the basic ideals of the science; ten treat of its application. Among the former are discussions of early human remains, apes, race, genetics, carbon 14 and fluorine dating, the variety and classification of languages, culture and personality, human ecology, style, characters of civilizations or cultures, social science and the humanities. Only one paper (on fossil man) is in German. Each paper has its own bibliography. The volume closes with an extensive paper by J. H. Rowe on "Technical Aids in Anthropology, a Historical Survey," which consists of thirty-four pages of discussions and eleven pages of bibliography.

ANTS OF CALIFORNIA, by Thomas Wrentmore Cook. Pacific Books, P. O. Box 558, Palo Alto, Calif., 1953. 462 pp., 87 pl., 2 maps, \$10.00

595.796 QL568.F7C77 53-684

Inspired under the aegis of the famous Dr. William Morton Wheeler of Harvard twenty years ago, the author presents here part of the results of the last twenty years of his work on Californian formicidae. The book contains sections of anatomical diagrams, an illustrated key to the genera, discussions of the economic importance of ants and their control, particular emphasis on ant pests and control literature, together with lists of general works on ants, a technical bibliography, and a glossary. Of particular interest is the enumeration of the original repositories of formicidae types.

ANTHROPOD ANATOMY, A TEXTBOOK OF, by R. B. Snodgrass. Cornell University Press, 124

Roberts Pl., Ithaca, N. Y., 1952. 363 pp., 88 fig., \$6.00
595.2 QL434.S43 52-14887

Excluding only the dubiously arthropod Tardigrada and the Pentastomida, this textbook covers the Trilobites, Limulus, the Eurypterids, the Pycnogonids, the Arachnids, the Crustacea, the Chilopoda, the Diplopoda, the Pauropoda, the Symphylea, and the Hexapoda. The author is a collaborator in the U.S.D.A. Bureau of Entomology and Plant Quarantine. There is a 12-page bibliography.

BACTERIAL AND MYCOTIC INFECTIONS OF MAN, by Rene J. Dubos. The J. B. Lippincott Co., East Washington Sq., Philadelphia 5, Pa., 1952. 886 pp., 73 tables, 16 charts, 80 fig., \$7.50
616.01 RC115.D75 52-4145

Aided by a grant from the National Foundation for Infantile Paralysis, Inc., this second edition has made no radical departures from the first 1948 edition. It is a distinctly cooperative venture; thirty-six outstanding authorities in their specific fields have contributed papers either alone or jointly as the subdivision warranted. While in no sense a textbook, this

massive volume should be an indispensable adjunct to the working book shelf in any laboratory where infections are studied. There is a seventeen-page bibliographic index; there are twenty-five pages devoted to indexing the subject matter.

BASIC KINESIOLOGY, by Fred J. Lipovetz. Burgess Pub. Co., 426 South 6th St., Minneapolis, Minn., 1952. 105 pp., 92 fig., \$3.75
612.76 QP303.L52 52-2052

Seven chapters are devoted to anatomy as it applies to kinesiology, body center of gravity, applied body mechanics, safety and posture mechanics, study of muscle action, muscular action in reference to origin and insertion, and an analysis of muscular movement. There is also a table of sines and cosines, and a valuable 15 by 21 inch muscular movement chart. The book is designed as a manual for a physical education course in kinesiology.

BETWEEN PACIFIC TIDES, by E. F. Ricketts and Jack Calvin, rev. by J. W. Hedgpeth. Stanford University Press, Stanford, Calif., 1952. 502 pp., 134 fig., 55 plates, \$6.00
591.925 QL138.R5 52-6351

The original of this fascinating book appeared in 1939. It was reprinted in 1948. This is the third edition. The senior author died in 1948; the junior author has contributed a new preface and the reviser has done a worthwhile job in his changes, corrections and in rewriting the appendix which is in two parts, — an annotated systematic index and bibliography and a selected list of nonspecific books and accounts. These bring the book up to date. It remains largely as it was, a collector's book, — based on habitats rather than genera, — proceeding from protected outer coasts through open coasts, to bays and estuaries, not omit-

ting wharf piling, plankton and the intertidal zonation.

BIOLOGICAL HAZARDS OF ATOMIC ENERGY, ed. by A. Had-dow. Oxford University Press, 114 Fifth Ave., New York 11, N. Y., 1953. 235 pp., \$8.00

Twenty-four papers were presented by as many authors at the conference convened by the Institute of Biology and the Atomic Scientists Association held in October, 1950, at the Royal Institution. Although the information regarding atomic energy continues to pour from research laboratories all over the world, it is safe to say that this book contains much information that is no where else so precisely put. The papers range the gamut of the field, all the way from biological response to penetrating radiations to the moral issue of atomic energy and the scientist's responsibility as a citizen.

BLOOD CELLS AND PLASMA PROTEINS, ed. by James L. Tullis. Academic Press, Inc., 125 East 23rd St., New York 10, N. Y., 1953. 436 pp., \$8.50
612.11 QP91.T9 53-1087

This is the second volume of Harvard University Laboratory of Physiological Chemistry Memoirs. It contains papers related to medicine and public health by twenty-nine contributors, fourteen of whom are connected with the departments of the university. The papers are grouped under seven heads: The formed and fluid parts of human blood; factors in blood coagulation; components concerned with immunity; erythrocytes; leucocytes; plasma enzymes; and blood and other tissue lipoproteins. The book is valuable as a summary of the state of current knowledge about blood and its component parts.

BODILY CHANGES IN PAIN, HUNGER, FEAR AND RAGE,

by Walter B. Cannon. Charles T. Branford Co., 551 Boylston St., Boston 16, Mass., 1953. 404 pp., 42 fig., \$5.00

This is a reprinting of the second (1929) edition of the original 1915 work, which has become more or less of a classic in its own field.

CAT, THE DISSECTION OF, by Bruce M. Harrison. The C. V. Mosby Co., St. Louis, Mo., 1952. 209 pp., illus., \$3.50

This is the second edition of the original 1948 work. The whole work is punched for a three-ring binder, each page being perforated for quick removal. There is a glossary of definitions and a page of references.

CEREAL BREEDING PROCEDURES, by J. B. Harrington. Columbia University Press, 2960 Broadway, New York 27, N. Y., No date. 122 pp., 16 appendices, \$1.25

The Food and Agriculture Organization of the United Nations (FAO) here reports on a practical breeding program for wheat, rice and other small grains in relatively under-developed countries.

COLLEGE GUIDE, by Clarence E. Lovejoy. Simon and Schuster, Inc., 630 Fifth Ave., New York 20, N. Y., 1953. 247 pp., \$2.95

A52-10696

Subtitled "A Complete Reference Book to 2,049 American Colleges and Universities for Use by Students, Parents, Teachers and Guidance Counselors," this book lives up to its purpose. The "capsule" summary on each of the 2,049 institutions is only one paragraph long, but it covers about all the ground necessary for a decision whether or not to ask further information. Valuable as these brief items are, they are only incidental to the first part of the book which treats in seven chapters of college as a gateway to a career, advice to parents, college

costs, student financial aids, governmental assistance, admission procedures, and which college to choose.

COMPARATIVE EMBRYOLOGY, A LABORATORY MANUAL OF, by Alfred F. Huettnner. The Macmillan Co., 60 Fifth Ave., New York 11, N. Y., 1953. 115 pp., \$1.75.

This is the lab manual to accompany the author's "Fundamentals of Comparative Embryology of the Vertebrates." There are twenty-five exercises, all of them detachable.

CYCLAMEN PERSICUM, by Walter C. Blasdale. Stanford University Press, Stanford, Calif. No date. 49 pp., 7 plates, 7 fig.

This treatment of the genus is divided into four parts: botanical relationships and early history, distinctive morphological characters, features in life history, and in cultivation. There is a page of bibliography with twenty-two references.

CYTOCHEMISTRY, by J. F. Danielli. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 1953. 139 pp., 12 plates, 10 tables, 7 fig., \$4.00

576.3 QH611.D3 52-12420

This new volume in the Wiley Biological Research Series is subtitled "A Critical Approach." Its seven chapters include an introduction, fixation procedures, alkaline phosphatase, cytochemistry of proteins and nucleic acids, quantitative studies and the future outlook in cytochemistry.

DEVELOPMENT OF THE CHICK, by Frank R. Lillie, rev. by Howard L. Hamilton. Henry Holt & Co., 383 Madison Ave., New York 17, N. Y., 1952. 624 pp., 283., \$8.50 591.33 QL959.L7 52-7484

Dr. Lillie first published this work in 1908. He was then attempting to present a consecutive account of the chick's development from ovulation to

hatching. The original book was an instant success and ran through two additional editions in 1919 and 1936. Present revision was begun in 1945 by Dr. Hamilton, but Dr. Lillie died in 1947; so the work is dedicated to his memory. Thirty years of embryological literature are represented in the thirty-one page bibliography.

DIFCO MANUAL, Difco Laboratories, Detroit 1, Mich., 1953. 350 pp., Free.

This manual of dehydrated culture media and reagents for microbiological and clinical laboratory procedures is now in its ninth edition since the original appeared in 1927. There are six main sections devoted to dehydrated culture media, the ingredients of culture media, tissue culture reagents, serological reagents, diagnostic reagents and miscellaneous products.

ELEMENTS OF BIOLOGY, by Smallwood, Reveley and Bailey, rev. by Ruth A. Dodge. Allyn & Bacon, Inc., 2231 South Park Way, Chicago 16, Ill., 1952. 746 pp., 411 fig.

This is a new edition of a high school text which has seen long and successful service under the old name of "Biology for High Schools." The author is past President of the National Association of Biology Teachers. Into this presentation have been woven such modern developments as the antibiotics, vitamin B12 and folic acid, cortisone, the Rh factor, the back pressure-arm lift method of resuscitation, and the need for cancer and heart research. These subjects and two new chapters on life processes in plants and animals, and conservation of resources bring the book strictly up to date. Each chapter ends with teaching aids such as questions, completion tests, projects, and a list of references at the high school level. There are few diagrams, but many fresh and arresting photographs.

EUGLENA, THE GENUS, by Mary Gojdics. University of Wisconsin Press, 811 State St., Madison, Wis., 1953. 268 pp., 39 plates, 8 text fig., \$6.50.

At last an earnest worker has assembled together in one complete volume all the available and scattered data on the most challenging of all plant or animal genera, *Euglena*. It has taken her more than twenty years of more or less continuous research to produce this book, but anyone interested in things physiological or protozoan will have reason to thank the author. The book contains forty valuable pages of anatomical data, fourteen on keys, and one hundred on taxonomy. There are thirty pages of lists and discussions on all the 300 reported species, forty-four of plates, and a thirteen-page bibliography containing 260 references. The taxonomic discussion is conveniently broken down into eight groups depending on the structure of the chromatophore.

EVOLUTION IN ACTION, by Julian Huxley. Harper & Brothers, 49 East 33rd St., New York 16, N. Y., 1953. 182 pp., 9 illus., \$2.75.
575 QH367.H97 52-5450

This small and unpretentious book sums up the biological philosophy of one of the outstanding writers of our times. Mr. Huxley, grandson of the redoubtable Thomas, has been a preacher and a prophet of evolution since his youth. This reviewer met him at an art show in Woods Hole, Mass., some thirty years ago. He was as sparkling a personality then as he is a writer now.

EVOLUTION, PRINCIPLES OF ORGANIC, by Arthur Ward Lindsey. The C. V. Mosby Co., 3207 Washington Blvd., St. Louis 3, Mo., 1952. 375 pp., 216 fig., \$5.75.
575 QH366.L46 52-10812

This is a college textbook which does not claim to settle everything in the student's mind. It strenuously champions the fact that few scientists are primarily evolutionists. Rather, the outstanding evolutionists have been specialists in taxonomy, paleontology, comparative anatomy, and, above all, genetics. This book aims only at being a broad introductory survey, sufficient in a liberal education, and a guide for the evolution of the future.

FARM AND COLLEGE, by W. H. Glover. The University of Wisconsin Press, 811 State St., Madison, Wis., 1952. 462 pp., \$5.00.
630.711 5537.W799.65

52-13543

Published as part of the memorial for the hundredth anniversary of the University of Wisconsin, this book presents the share of the College of Agriculture in that event. The development of that school has been contemporaneous with the rise of the state of Wisconsin from a pioneer backwoods economy to a great dairy and agricultural commonwealth. This book integrates it all, not forgetting the great deans and greater research men who had a hand in making the Agriculture School, the University, and the State what they are today. It wasn't all plain sailing, as this book very plainly points out.

FERNS AND FERN ALLIES OF WISCONSIN, by R. M. Tryon, Jr., N. C. Fassett, D. W. Dunlap and M. E. Diemer. The University of Wisconsin Press, 811 State St., Madison, Wis., 1953. 158 pp., 215 fig., 76 maps, \$3.50.

Middle western botanists, particularly the pteridologists, will be glad that the original E. M. Gilbert edition of 1940 has been revised and brought up to date, especially in that the terminology has been brought into line with the new eighth edition of Gray's *Manual*. The book treats of the Polypodiums, Osmundas and Adders-

tongues in the True Ferns, the Salvinias, Equisetums, Lycopods, Selaginellas, and the Isoetes in the Fern Allies.

FISH PONDS AND AQUARIA, by Rosslyn Mannering. British Book Centre, Inc., 122 East 55th St., New York 22, N. Y., 1951. 120 pp., 11 plates, 3 fig., \$1.00.

This little paper-bound book is a revised reprint of the 1935 edition in Cassell's Pet and Livestock series. It is a fine little book as far as it goes, — and it will go a long ways to make the keeping of ponds and aquaria a fascinating hobby. One thing is a surprise to this editor, and that is the lack of reference to scavenger fish, — as well as the snails mentioned. Is it possible that those interesting Central and South American tribes of the Corydoras, the Otocinclus, Plecostomus and the rest are not popular in Britain or beyond the range of the average British purse in these austere times?

FLEAS, FLUKES AND CUCKOOS, by Miriam Rothschild & Theresa Clay. The Philosophical Library, Inc., 15 East 40th St., New York 16, N. Y., 1952. 304 pp., 99 illus., 22 fig., 4 maps., \$8.75.
598.2 QL757.R65 52-11938

Every now and then something new pops up in the realm of biological literature. There isn't anything really new under the sun, they say, but there is still plenty of opportunity for fresh approaches to old subjects. Here is something fresh, if not entirely new. It is a study of bird parasites by British zoologists who are authorities on bird fleas, bird flukes, and bird lice. Miss Rothschild is a talented member of the famous banking family. Miss Clay is a member of the staff of the British Museum. Together they offer witness to the truth of Shipley's dictum: "Birds are not only birds, but aviating zoological gardens."

FLOWERS OF THE SOUTH, by W. F. Greene & H. L. Blomquist.

University of North Carolina Press, Chapel Hill, N. C., 1953. 208 pp., prof. illus., \$5.00.

This is a flower lover's book without regard to previous educational preparation. More than 500 flowers are figured in black and white, and there are 55 color plates of arrangements representing over 300 flowers. Names are from the new eighth edition of Gray. The first 148 pages are devoted to some 444 native forms. The rest of the book deals with subtropical exotics from everywhere that are being introduced into the South.

FOOD FOR LIFE, ed. by Ralph W. Gerard. University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill., 1952. 306 pp., illus., \$4.75. 612.39 QP141.638 52-14880

Inspired neither by nutritionists' demands, nor by humanitarian research, this book is a professional reply to the requests of businessmen, bakers and advertisers, who want sound information on nutrition. The authors include experts in chemistry, biochemistry, physiology, nutrition, and public health, working together under the leadership of a physician. The book is sponsored by the University of Chicago's committee on publications in biology and medicine, which ought to vouch for its utter reliability. It is attractively illustrated with charts, tables, sketches and diagrams.

FRESH-WATER INVERTEBRATES OF THE UNITED STATES, by Robert W. Pennak. The Ronald Press Co., 15 East 26th St., New York 10, N. Y., 1953. 769 pp., 470 illus., 12 tables., \$14.00.

Dedicated to the memory of one of the University of Wisconsin's great biologists of the past, Dr. Chauncey W. Juday, this monumental work has been checked in every group discussed by thirty-three specialists, including our own former secretary, Dr. vander Schalie, who handled the MSS on Gas-

tropoda and Pelecypoda. The work covers all the U.S. fresh-water forms from protozoa to the Pelecypoda. Not since the days of Ward and Whipple has this been done so thoroughly. The book could be used for a senior college text. It will be inevitably a reference for entomologists, fishery folks, limnologists, as well as the rank and file of zoologists and aquatic biologists.

FUNCTIONAL NEUROANATOMY, by Wendell J. S. Krieg. The Blakiston Co., Inc., 575 Madison Ave., New York 22, N. Y., 1953. 600 pp., 413 illus., \$9.00. 611.8 QM451.K7 52-14927

Even the printer's ink smells good in this large volume. The type is beautifully large and clear and the black and white illustrations beggar words to describe them. Since the days of Vesalius there hasn't been anything half so good. The atlas of sections and slice reconstructions is done in a three dimensional technique, which should be considered by all comparative anatomy and morphology textbook producers, whether their fields are zoology or even botany.

FUNGI, by E. A. Gaumann, tr. and rev. by F. L. Wynd. Hafner Pub. Co., 31 East 10th St., New York 3, N. Y., 1952. 420 pp., 440 fig., \$10.00. 589.2 QK603.G314 53-1232

Concentrated on the morphology and the development of the fungi, with the bibliography restricted to only the latest publications in this field, this book is manifestly a godsend to the research worker who wants facts and is not interested so much in the historical literature that has grown up around them. The approach is, therefore, factual and dynamic, rather than theoretical and taxonomic. This does not mean that there is no geological or evolutionary material present. The rusts and smuts are thoroughly treated along these lines. The capable hand of the translator and reviser has left this

material as fresh and attractive as if it were an English original.

GENERAL BIOCHEMISTRY, by J. S. Fruton & Sofia Simmonds. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 1953. 940 pp., \$10.00.

53-5669

Both Ph.D.'s and both on the Biochemistry Staff of Yale University, the authors of this new work have chosen to emphasize dynamic principles against a background of structural biochemistry exemplified with plant, animal and microbiological organisms. Since so many of these are mentioned, it might not be out of place to suggest that future editions might well carry a special index of forms referred to. Research workers would find it helpful especially since the wealth of modern research references makes it very easy to overlook significant results where isolated organisms are concerned as intermediate reactors.

GENERAL BIOLOGY LABORATORY GUIDE, by J. E. Wodsealek & H. L. Dean. Wm. C. Brown Co., 915 Main St., Dubuque, Iowa, 1949. 257 pp., 287 fig., \$3.00.

This laboratory guide by two professors, the former in zoology at the University of Minnesota, the latter in botany at the State University of Iowa. It is spiral wire bound, no detachable pages, so that the whole manual will have to be turned in for corrections and grading each time. The first four chapters are devoted to comparison of higher animals and plants, use of the microscope, elementary cytology, histology and embryology. Chapters five to nine are devoted to plant physiology, ten to a survey of the plant kingdom. Chapters eleven to twenty-one cover the animal phyla.

GENERAL BOTANY, by G. M. Smith, E. M. Gilbert, G. S. Bryan, R. I. Evans, & J. F. Stauffer. The

Macmillan Co., 60 Fifth Ave., New York 11, N. Y., 1953. 606 pp., 429 fig., 3 tables., \$6.25.

580 QK47.S65 53-8595

This is the fifth and thoroughly revised edition of the original 1924 well-known and widely used manual which, because of the original list of cooperating authors at its source, has come to be popularly known as the "Wisconsin Text." The main plan remains the same, but the changes have been so many and so complete that this book must be seen and carefully read to be appreciated. The new first chapter is a model for brevity in the integration of botany into the college curriculum, bearing as it does, without saying so, on the fields of anthropology, world history, sociology, and conservation.

GENERAL PHYSIOLOGY, by Bradley T. Scheer. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 1953. 613 pp., 110 fig., \$7.00.

This is an entirely new text which is bound to make friends in its application of physiological principles common to most organisms in genetics, embryology, growth, cancer and aging, without becoming cluttered with extraneous detail. It is up to the minute in its references to the most recent research. The bibliography contains 1453 titles. The five main divisions of the book cover physicochemical foundations of life, its chemical dynamics, energy transformations, the development of organisms, and their integration.

GRASSES AND GRASSLAND FARMING, by H. W. Staten. The Devin-Adair Co., 23 East 26th St., New York 10, N. Y., 1952. 317 pp., plates, maps, charts, \$5.00.

633.2 SB197.S78 52-14598

Prepared by the Professor of Agronomy at Oklahoma A & M College, and introduced by the well-known writer-farmer, Louis Bromfield, this

unpretentious book merits as much attention as our own Paul Sear's "Deserts on the March." The author says: "I have written not a textbook but a practical discussion of the role grass plays in feeding livestock. It will be of interest to farmers, ranchers, students, teachers, county agents, soil conservationists, and seelmen."

HEREDITARY GENIUS, by Francis Galton. Horizon Press, Inc., 63 West 44th St., New York 10, N. Y., 1952. 379 pp., \$3.75.

Out of print for many years, sixty or so, this famous classic has at last been given the grace of a reprinting. As the pioneer work on the application of the statistical method to social problems, Galton was one of the first, if not actually so, to express the laws of inheritance in numerical terms. Hitherto most of us knew the work only by quotation. Now we have a chance to enjoy it as much as Charles Darwin claimed he did in his memorable letter to the author.

HORTICULTURE, LABORATORY EXERCISES IN, by J. A. Foret, H. E. Nichols, E. S. Haber. Iowa State College Press, Press Bldg., Ames, Iiwo, 1953. 121 pp., 60 fig., \$2.25.

There are not too many lab manuals for horticulture on the market. This is a good start. This revised second edition covers the usual fields of horticulture, classification of horticultural plants, production, identification and judging, vegetable, fruit and flower gardening, propagation methods, pruning, plant diseases, plant pests, and planting.

IMMACULATE FOREST, by W. R. Philipson. Philosophical Library, Inc., 14 East 40th St. New York 16, N. Y., 1952. 223 pp., 31 plates, \$4.50.
918.61 F2263.F477 52-2970
Dr. Philipson of the British Museum headed a scientific expedition into

the Colombian Andes and to the very southeasternmost parts of the country, the narrow panhandle that lies squeezed in between eastern Peru and Brazil. This is the story of their experiences and collections in remote jungles unmapped and uninhabited even by Indians. Some of their finds were bizarre, like the epiphytic cactus growing on the boughs of trees, carrion-eating butterflies, or the olive oropendola, a bird that bends his head down under his perch until its bill is back up under his own tail, at which time it utters a resounding ringing pop.

IMMUNITY, HYPERSENSITIVITY, SEROLOGY, by Sidney Raffel. Applton-Century-Crofts, Inc., 35 West 32nd St., New York 1, N. Y., 1953. 531 pp., 48 fig., 15 tables.

616.97 QR181.R33 52-13694

The author's intention is to describe immunity in basic terms, especially with regard to resistance. Much space is given to serology, but serological considerations are kept subservient to the main theme of immunity. There may be some overemphasis on antibodies in the forepart of the book, but later discussions of infectious diseases counterbalance it. In view of the loose way in which the word immunity has come to be used this book should serve a useful purpose in getting people's minds straightened out on it.

INSECT PHYSIOLOGY, ed. by Kenneth D. Roeder. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 1953. 1100 pp., 257 fig., 56 tables, \$15.00.
595.7 QL495.R6 52-11489

This is a lot of book for the price. The fifteen contributing authors and the editor present thirty-two papers from the structure and function of the integument, all the way up to the problems of behavior, embryological development to the role of hormones in molting and metamorphosis. There are 107 pages of bibliography, and the

index alone takes up fifty-nine two-column pages. The book has for its objective the summarization and evaluation of the major trends in experimental research on insects. Each topic is the work, therefore, of one of the research workers in the field about which he writes.

INTRODUCTORY PLANT SCIENCE, by Henry T. Northen. The Ronald Press Co., 15 East 26th St., New York 10, N.Y., 1953. 601 pp., 418 illus., \$5.50. 580 QK47.N67 53-5715

Elimination of life-cycle diagrams, limitation of sketches and line drawings, use of superb photographs in profusion, a colloquial and down-to-earth style of presentation, conciseness, integration, and application of botany to human affairs, are all characteristics of this new manual from the biology department of the University of Wyoming. The results of latest plant research and classification systems are all incorporated.

LATHYRUS, REVISION OF N. A. SPECIES, by C. Leo Hitchcock. University of Washington Press, Seattle 5, Washington, 1952. 104 pp., 41 fig., 10 maps, 2 charts, \$2.50.

This hardly more than pamphlet size volume contains a description of the species, index to collections seen, representative collections examined, an index of pertinent names, and the bibliography. Those who are professionally interested in these little known sweet-pea-like garden plants now have something to rally around.

LIMNOLOGY, by Franz Ruttner, tr. by D. G. Frey & F. E. Fry. The University of Toronto Press, Toronto 5, Ontario, Canada, 1953. 242 pp., 51 fig., \$6.50.

Based on the course in Hydrobiology given at the Lunz Biological Station for some years, this manual is intended mainly to complement the

standard books on the subject. Half of the text is devoted to water as an environment, and the transformations of dissolved substances in it. The second half discusses plankton and other lake communities, bogs and running water communities. There is a bibliography and a really complete index.

MAN AND EPIDEMICS, by C. E. A. Winslow. Princeton University Press, Princeton, N. J., 1952. 246 pp., 17 fig., 4 tables, \$4.00. 614.09 RA424.W52 52-8782

Although not designed for the expert, this book not only provides the layman with an account of engineering practices and scientific methods which make relatively disease-free living possible, but it also gives a historical and philosophical background to public health work. After all, it is only by water, milk, food, insects and rodents that disease is transmitted. That the conquest of these infection sources has lengthened the average American's life span by twenty-five years is not well realized.

MAN, THE CHEMICAL MACHINE, by Ernest Borek. Columbia University Press, 2960 Broadway, New York 27, N. Y., 1952. 219 pp., \$3.00. 612.015 QP514.B67 52-14245

Hans Zinsser once said (in *Rats, Lice and History*): "Biology began as it will end — as applied chemistry and physics." It is good to see this quotation revived in the closing chapter of this more or less philosophical study of biochemical history. It unfolds the biochemist's view on the mechanism of the living machine and shows how he changes his ideas with new findings. The ultimate chemical basis of genetics, of immunology, and of virus research is developed for the first time in any book. The author is engaged in research at the College of Physicians and Surgeons of Columbia University, while he teaches biological

chemistry at the City College of New York.

MANTA, by Hans Hass. Rand McNally & Co., Box 7600, Chicago 80, Ill., 1953. 328 pp., 84 photos, \$4.50

591.927 QL137.H314 53-6152

Hans Hass was the first of the well-known "skin-divers" who proved that all the equipment needed was a pair of fins, a mask and breathing apparatus. Here he tells the story of his 1949 visit to the waters along the west side of the Red Sea (near Port Sudan) and the experiences he had there with various fish, chiefly the manta, which he learned to handle up to the point of getting underwater closeup photographs of this sea monster. This is a fascinating book, full of deep sea discovery and adventure. You'll like it!

MANUAL OF COMPARATIVE ANATOMY, by O. P. Breland. The Mc Graw Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y., 1953. 256 pp., \$4.50.

611.072 QL805.B82 52-10329

Those who are looking for a manual to suit a whole year's course in comparative anatomy should see this one. This is its second edition, the first having appeared just ten years ago. The dissections are so carefully described that it would be a "thick" students indeed who could not follow the step-by-step procedure as detailed here.

METABOLIC INTERRELATIONS, ed. by E. C. Reifenshtein. Josiah Macy, Jr. Foundation, P. O. Box 575, Packanack, N. Y., 1952. 262 pp., 50 fig., 16 tables, \$4.50

Twenty-seven professional men from different interested walks of life met in conference January 7-8 last year to discuss metabolic interrelations with special reference to calcium. Among phases discussed were, of

course, teeth, fluorides, sodium in bone, hydroxylapatite relations, tricalcium phosphate and bone, parathyroid extracts, ion-binding in cartilage, portein in bone and in tendon and heart valves, and the chemical structure, formation and destruction of cartilage and bone matrix. This is the eighteenth conference report. The others, equally interesting, are available from the publishers.

MICROBIOLOGY AND HUMAN PROGRESS, by Madeleine P. Grant. Rinehart & Co., Inc., 232 Madison Ave., New York 16, N. Y., 1953. 718 pp., illus., \$6.75

52-12517

Written as an introductory text for bacteriology and microbiology taught as cultural courses for nonscience students, this is the sort of "general information" on the subject book that will help to interest the uninformed and straighten out the misinformed. It is specifically slanted toward the general education programs. It has three parts, fifteen chapters devoted to the biology of microorganisms, two to microbic friends of man, and twelve to the microbic foes of man. A certain foreign flavor is lent by the use of many pictures from the farthest parts of the earth.

MICROBIOLOGY, FUNDAMENTALS OF, by Martin Frobisher, Jr. W. B. Saunders Co., 218 West Washington Sq., Philadelphia 5, Pa., 1953. 633 pp., 253 fig., 25 tables. Prices not given.

52-12874

This is the fifth edition of a standard text which first came on the market in 1937. It has been completely revised and rewritten, with bibliographies, etc., brought up to date. In spite of all the editions, the book is 300 pages shorter than its predecessors.

MICROBIOLOGY, PRINCIPLES OF, by Walter W. Krueger. W. B. Saunders Co., 218 West Washing-

ton Sq., Philadelphia 5, Pa., 1953. 648 pp., 143 fig.

Intended as an introductory text in college courses, with a biological approach. The book is divided into thirty-four chapters grouped under the following heads: introduction, microscopic world, physiology of microorganisms, sewage and water, foods, infection and bodily defenses, infectious diseases. It is well but not precisely profusely illustrated. Each chapter ends with review questions and a group of reference materials.

MICROTECHNIQUE, H A N D - BOOK OF BASIC, by Peter Gray. The Blakiston Co., Inc., 575 Madison Ave., New York 22, N. Y., 1952. 141 pp., 57 fig., 2 tables, \$3.00.

578 QH231.G8 52-170

This concise book has something that hasn't been brought out so clearly in many years of publication on microtechnique, or histology, or micrology, — however it may happen to be called. There are several series of step-by-step illustrations of the processes involved in whole-mounting, smearing, sectioning and mounting of material. The second part of the book gives special techniques, as for example, mounting small insects, chick embryos, intestinal sporozoans, bacteria, x-sect root, stems, tongue, and so forth.

MR. TOMPKINS LEARNS THE FACTS OF LIFE, by G. Gamow. Cambridge University Press, 32 East 57th St., New York 22, N. Y., 1953. 87 pp., 14 fig., 6 plates, \$2.75.

Two previous books by George Gamow on Mr. Tompkins' adventures in wonderland and his exploration of the atom hit the funnybones of the chemists and physicists resounding shocks. This volume does as much for the biologists, or shall we say, the zoologists, since the plants remain sedately on the side lines. Since that forgotten

volume "Just Like the Flowers, Dear," there hasn't been anything quite so scientifically accurate, yet provokingly funny.

NATURAL COMMUNITIES, by Lee R. Dice. University of Michigan Press, Ann Arbor, Mich., 1952. 547 pp., 51 fig., 17 tables, \$5.50.

574.5 QH541.D5 52-3960

The author of "The Biotic Provinces of North America" here presents the newest and, to this ecology instructor, the best recent volume on the relationships of plants and animals with their environment. There hasn't been a good, all around bio-ecology since the Clements and Shelford manual which was first issued in 1930 and last reprinted in 1947. This new volume might not have been intended as a classroom text, but there would appear to be no valid reason why it should not be so used, particularly in introductory courses which are offered to students for cultural as well as professional purposes.

NEOMYCIN, by S. A. Waksman. Rutgers University Press, New Brunswick, N. J., 1953. 219 pp., 103 tables, 37 fig., 1 plate, \$4.00 615.329953 RM666N35W2 53-6250

Subtitled, "Nature, Formation, Isolation and Practical Application," this book was produced with the collaboration of fifteen research workers named on the title page. Carried out in 1940-41, the research involved resulted in the isolation of actinomycin and streptothricin. Later streptomycin, grisein, streptomycin, streptothricin IV and the new neomycin were isolated, the last in 1949. This book gives its story, its background, its discovery, its nature and the practical applications as an intestinal antiseptic, as well as for other bactericidal purposes.

NEW BIOLOGY 13. Penguin Books, Inc., 3300 Clipper Mill Rd., Balti-

more 11, Md., 1952. 128 pp., illus., \$50.

49-11497

Twice a year, each April and October, Penguin issues this little paper-bound book with short (between ten and twenty-page) articles announcing new research results or analyses of the work of others. This issue contains articles on keeping wild animals in captivity, polyploidy and plant breeding, the thyroid gland, the bed-bug, and one of the famous plants, mucor.

NORTH AMERICAN SMUT FUNGI, by George W. Fischer. The Ronald Press Co., 15 East 26th St., New York 10, N. Y., 1953. 343 pp., 136 fig., \$8.75.

589.2271

QK628.A1F58

52-12520

This manual covers twenty-two genera, 276 species, and several varieties of smut fungi on species of 242 host genera. Wherever the author found morphological details not previously mentioned, they have been more extensively presented. The book begins with a host genus index and species key, arranged alphabetically, that takes up thirty-six pages. This is followed by a key to the genera of the infector, followed by detailed studies of the various North American forms. The author is Professor of Plant pathology at the State College of Washington.

NUCLEAR REACTOR THEORY, by Samuel Glasstone & Milton C. Edlund. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York 3, N. Y., 1952. 416 pp., fig., \$4.80.

539.76

541.2

QC786.658

52-12438

This book aims to fill the gap in the literature of nuclear science, because up to now there hasn't been in one publication an organized and complete treatise on both homogeneous and heterogeneous reactors. Mainly aimed at the engineer and the scientist, there are still four introductory chapters for those not familiar with basic

nuclear physics. The senior author is consultant to the United States Atomic Energy Commission; the junior author is physicist at Oak Ridge National Laboratory.

ORGANIC CHEMISTRY, VOLS.

III and IV, ed. by Henry Gilman. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 1953. 1283 pp., fig., tables, \$17.50.

Selling separately at \$8.75 each, these two volumes complete the series begun in 1937 and republished in 1942. Volume III is made up of papers by Paul Bartlett on organic reaction mechanisms; Foil Miller on use of infrared and ultraviolet; Cowan and Carter on lipids; Grimmel on organic dyes; Ing on chemotherapy and Cheney on antibiotics. Volume IV consists of papers on the terpenes by Eastman and Noller; heterocyclic chemistry by Richard Wiley; starch by W. Z. Hassid; chemistry of explosives by George Wright; gas reactions under pressure by Hanford and Sargent; and oxidation processes by William A. Waters. Each article has its own bibliography and each volume contains the combined index for these two volumes. Incidentally, this index consists of thirty-eight two-column pages.

PARENTAL CARE AND ITS EVOLUTION IN BIRDS, by S.

Charles Kendeigh. University of Illinois Press, Urbana, Ill., 1952. 356 pp., 52 tables.

598.2 QL698.K38 52-5887

This is a study of bird behavior, mainly centered around the house wren, on which 127 automatic recordings were made, opposed to thirty-nine for other species, as well as 1,075 daily twenty-four hour records, as opposed to 428 for other species. Mechanical methods in addition to direct observation included use of the thermocouple and potentiometer, perch contacts and electromagnet, terragraph and the photoelectric cell. The results

are surprising. The first ninety-two pages are devoted to the house wren, the next seventy-five pages of the main text cover the attentive behavior of miscellaneous species. Evolution of parental care takes up the next 130 pages. A forty-two page bibliography completes this study.

PERSONALITY OF ANIMALS, by H. Munro Fox. Penguin Books, Inc., 3300 Clipper Mill Rd., Baltimore 11, Md., 1952. 20 fig., \$.50.

Another and very interesting study in animal behavior. The author concludes by drawing interesting comparisons between personality and individuality in people and the sources from which they are derived. He then goes on to compare human personality with what resembles it in the animal. His final deduction is that animals do have personal differences or habits that are not genetically acquired. Also, that animals with fewer instincts have more personality, i. e., lead lives governed by acquired habits. The instinctive animal, the insect, and sometimes the bird have less personality.

PHILIPPINE ORCHIDS, by R. S. David & M. L. Steiner. The William-Frederick Press, 313 West 35th St., New York 1, N. Y., 1952. 270 pp., \$5.00.

52-7534

Anyone of the thousands who served in the Philippines in World War II may have run into an orchid fancier and his flowers. He or she may have run into the orchids minus the fancier, as did the Editor, or vice versa. It is with pleasure, therefore, that the lush floral vegetation of the Islands is brought back to memory in this richly illustrated account of forty-three genera and nearly a hundred exotic species.

PHYSICAL SCIENCE AND THE PHYSICAL SENSES, by Alexander Calandra. Washington University Print Shop, St. Louis 5, Mo.,

1952.

This is volume I of *Science and Vision*, whose author was very much surprised when notice of his work book appeared in the press. The book is printed on heavy white paper with a three-stapled back, which would permit of removal if necessary ((or the insertion of extra punched sheets). The whole book is devoted to vision from the earliest chapters to the very last.

PHYSIOLOGICAL APPROACH TO THE LOWER ANIMALS, by J. A. Ramsay. Cambridge University Press, 32 East 57th St., New York 22, N. Y., 1952. 148 pp., 46 fig., \$2.75.

Subdivided into eight chapters, each deals with a separate faculty: nutrition, circulation, respiration, excretion, muscle and nerve, sense organs, coordination and behavior. The author does not like to encourage the reading into animal behavior our own. He therefore starts by defining the animal's general problems and then shows how its problems are solved at the various levels.

PIG, THE NATURAL HISTORY OF, by Ida M. Mellen. Exposition Press, Inc., 386 Fourth Ave., New York 16, N. Y., 1952. 157 pp., illus., \$2.75.

599.7344

QL737.U5M37

52-10982

This is the first book, — so the wrapper says, — to give the complete story of the pig, beginning with its evolution, and carrying out its breeding, genetics, physiology, habits, psychology, and mythology. There are times when the author becomes more or less sympathetic for her subjects, and drools a bit over the way they are treated.

PIGMENT CELL GROWTH, ed. by Myron Gordon. Academic Press, Inc., 125 East 23rd St., New York 10, N. Y., 1953. 364 pp., plates,

fig., charts, \$7.00.

616.992 RC262.C55 52-13364

This is the report of proceedings at the third conference on the Biology of Normal and Atypical Cell Growth, November 15-17, 1951, by thirty-eight interested scientists from this country and England. The group at this conference decided on uniform usage for the following terms: melanoblast, melanocyte, macrophage, melanophore. The importance of this group's work is attested by the fact that its publication has been assisted by a grant from the Damon Runyon Memorial Fund.

POSSUMS, by Carl G. Hartman.
University of Texas Press, Austin
12, Texas, 1952. 174 pp., illus.,
\$6.00.

599.2 QL737.M3H3 52-14619

This is perhaps the most extensive work on the opossum in recent years. It is very readable, evidently the work of an enthusiast who has ranged all the ages and all the world for scientific facts, fiction, superstitions, and folklore which are woven into the book. The photography on the embryogeny and the post-foetal life of the young is unusual, to say the least. The book has been called "a natural history classic of the first water."

PRACTICAL BOTANY, by R. C. McLean & W. R. Ivimey-Cook.
Longmans Green & Co., Inc., 55
Fifth Ave., New York 3, N. Y.,
1952. 476 pp., 127 fig., \$7.50.

This book is a bit out of the ordinary, at least as far as American college texts go. It starts right off with an outline classification of plants, then takes up all sorts of methods, use of the microscope, reagents (and a whale of a lot of them). It next gives a twenty-one page treatment of cytology, and follows it up with evolutionary morphology from the chlorophyceae to ephedra. The morphology and histology of the angiosperms follows, after which comes sexual reproduction

of angiosperms. The classification of the angiosperms takes up twenty pages. Plant physiology, which comes next, takes ninety pages to complete. Then in succession come: modifications of normal plant forms, plant ecology, variational and heredity, and an appendix of receipts for stains and reagents. **There is also a four-figure logarithm table.** The authors teach in Wales.

PREVENTIVE MEDICINE, by H. R. Leavell & E. Gurney Clark. McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y., 1953. 629 pp., 64 tables, 28 fig., \$8.00.

614 RA425.L45 52-11513
This is an unusual textbook, as text-books go. It hasn't a single illustration in it. The twenty-one contributing authors all converge on the desire to promote health, prevent disease, without making the book a "vade-mecum," an epidemiology text, nor a biostatistical report, nor a manual for public health officials. It is not particularly enthusiastic about "field trips" or "field work" in preventive medicine. This book wants medical practitioners to be more preventive than curative or repair workers.

PREVIEW FOR TOMORROW, by Bruce Bliven. Alfred A. Knopf, Inc., 501 Madison Ave., New York 22, N. Y., 1953. 357 pp., 27 illus., \$5.00.

609 T185.B54 52-6410
Bruce Bliven is a reporter, interested in science. Here he gives the more important recent developments of science an airing for the benefit of the non-scientific layman. The book is well written and conveys a terrific amount of scientific developmental news in it. There is no bibliography.

PRINCIPLES AND PRACTICE IN PLANT CYTOLOGY, by W. S. Boyle. Burgess Pub. Co., 426 South Sixth St., Minneapolis 15, Minn.,

1953. 56 pp., 17 plates, \$2.50.

581.87 QH605.B66 53-389

We have announced all kinds of new products of scientific scriptorial brains, but this is the first time a cytology laboratory manual has crossed our desk. The last sixteen pages contain some of the finest mitotic division stages ever seen. Most of them are about the size of one of the pages of the "Biologist."

PROTEINS AND ENZYMES, by Kau Ulrick Linderstrom-Lang. Stanford University Press, Stanford, Calif., 1952. 115 pp., 65 fig., \$3.00.

52-5979

This is volume six in the Medical Science series published by the Stanford University Press. It consists of the five lectures given in Lane Hall, from October 2-12, 1951. The lectures are entitled "Micromethods in Biological Research, Distribution of Enzymes in Tissues and Cells, Stages in the Breakdown of Proteins by Enzymes, Enzymatic Breakdown of Ovalbumin, Biological Synthesis of Proteins."

PRUNING HANDBOOK, by Roy L. Hudson. Lane Publishing Co., Menlo Park, Calif., 1953. 80 pp., illus., \$1.50.

52-11628

The past President of the California Horticultural Society, who supervises maintenance in the recreation and park department of San Francisco, here gives us a manual that is more detailed, intelligible and instructive than any other one book on this subject in existence today. It is bound in paper, unfortunately, but a trip to the bindery, if you can spare it long enough, will remedy that.

RACE CROSSING IN MAN, by J. C. Trevor. Cambridge University Press, 32 East 57th St., New York 22, 1953. 47 pp., 1 plate, 1 fig., 24 tables, \$2.50.

From the Eugenics Laboratory Memoirs, Galton Laboratory, University College, University of London, comes this reprint of a scholarly and well documented paper that should be in every anthropological as well as genetic library.

RACCOON, by Leon F. Whitney & Acil B. Underwood. Practical Science Publishing Company, P. O. Box 746, Orange, Conn., 1952. 177 pp., 36 illus., \$3.75. 599.74443 SF405.R3W4 52-9766

Procyon lotor, L. has been divided into twenty-five subspecies and ranges throughout most of North America. There is hardly a very large area of wooded land in the United States that doesn't support at least a few. "Coons" are gluttonous and wasteful eaters. Their skins constitute one of the important commercial phases of the American fur industry. Pelts from the northern states are most desired, particularly the so-called "Northwest-erns," from Minnesota and Wisconsin. This book is a labor of love and covers more interesting and unusual ground than any recent animal book.

RADIATIONS AND LIVING CELLS, by F. G. Spear. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 1953. 222 pp., 60 fig., \$3.50.

This book is subtitled "An Introduction to Radiation Biology, in which the Action of Penetrating Radiations on the Living Cell is described with special reference to the Effect on Cell Division in Human Tissues." It is one of the "Frontiers of Science Series," and covers the following phases: history of medical radiation, living cells, scope of radiation biology, types of response, irradiation of skin and alimentary canal, blood and circulatory cells, the generative system, irradiation of whole body and use of atomic energy, radiation and cancer, theories concerning action of penetrating rays.

SCIENTIFIC TERMINOLOGY, by John N. Hough. Rinehart & Company, Inc., 231 pp., \$3.50.

501.4 Q179.H68 52-13874

The author is Professor of Classics at the University of Colorado, and dedicates his book to E. Gordon Alexander, Laurence H. Snyder, and Edward S. Thomas and his wife, most of whom are well known to members of Phi Sigma. The book is something we have long needed. It begins with the Greek and Latin alphabets, the formation of English words, roots, stems, and combining forms. Most of the earlier part of the work is pure phonetic; late it develops more into semantics. The divisions devoted to Latin forms and grammar in scientific literature, medical and pathological terminology, bacteriological nomenclature, pharmaceutical terminology, biological terms, the Linnaean System of Biological Nomenclature, the reading and writing of Latin descriptions, all fill a distinct void in modern scientific educational techniques.

SOIL SCIENCE, INTRODUCTION

TO, by G. W. Leeper. Cambridge University Press, 32 East 57th St., New York 22, N. Y., 1952. 222 pp., 12 plates, 36 fig., 35 tables, \$5.00.

Written originally for Australians, about Australian soils, in a language they might appreciate, this book is centered about the western district of the state of Victoria. Most people, conversant with the agricultural problems of the land "down under" get the idea that this area is very fertile. They do not realize that the fertility of this area is due to an extensive program of soil improvement. Agronomists in the United States will probably find this book interesting and informative. The author is Associate Professor in Agricultural Chemistry, University of Melbourne.

THE SOYBEAN INDUSTRY, by Ray A. Goldberg. University of

Minnesota Press, Minneapolis 14, Minn., 1952. 186 pp., 28 tables, 42 fig., \$5.00.

338.17334 HD9235.S62U63
52-12059

This book hails from the sixth state in the annual production of soybeans, a comparatively new industry, Minnesota's product having risen from \$16,000 to \$37,000,000 in ten years. Such an important change in agricultural economics called for a study of the entire related picture of supply and demand. Goldberg is an agricultural economics major from the University of Minnesota, and a graduate of the Harvard School of Business Administration.

STYLE MANUAL, U. S. GOVERNMENT PRINTING OFFICE, by John J. Deviny, Public Printer. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., 1953. 292 pp., paper \$1.00, cloth \$2.25.

Roy B. Eastin, Superintendent of Documents, is responsible for their presentation in acceptable form. Their responsibilities would astound the reading world if it would only stop long enough to realize the extent that our government is in the printing business. Every branch of the government has its own publications, some ephemeral, some permanent. The Congressional Record published daily during sessions of the Senate or House is an example of the former. The Annual Report of the Secretary of Agriculture is an opposite example of the latter which will appeal to most biologists. In order that all these multitudinous publications, magazines, books, documents, of whatever sort, maintain a standard of typographical excellence, there is a Government Printing Office Style Board, composed of five appointed and five ex-officio members. Theirs is the responsibility of laying down the canons by which all questions of printing routine will be handled. These approved solutions are made available to

the public in this volume. It makes interesting reading, and suggests many desirable practices in the preparation, proofing and printing of copy for publication. From now on the "Biologist" will follow the Government *Style Manual* wherever possible.

SURVEY OF BIOLOGICAL PROGRESS, VOL. II, edited by George Avery, Jr. Academic Press, 125 East 23rd St., New York 10, N. Y., 1952. 333 pp., illus., \$7.00. 574.082 QH301.S8 49-11497

Dr. George Avery, a member of Zeta in Phi Sigma back in the '20's, the present Director of the Brooklyn Botanical Garden, is the Editor of this volume. It is one of a series which attempts to keep the average biologist posted on marginal fields to their own interests. This issue contains, among others, articles on radiation effects, genetic progress, biological oceanography, morphogenesis in plants, plant hormones, histochemistry, structure of protoplasm, and physiology of plant reproduction.

SYSTEMATIC ZOOLOGY, METHODS AND PRINCIPLES, by E. Mayr, E. G. Linsley, R. L. Usinger. Mc Graw-Hill Book Co., 330 West 42nd St., New York 36, N. Y., 1953. 328 pp., 45 fig., \$6.00. 590.12 QL351.M28 52-11518

This is a purely advanced text for taxonomists in general and those interested in it from the zoological angle. The authors are connected with the American Museum of Natural History and the University of California. They divide the animal kingdom into four subkingdoms, and the metazoa into twenty-eight phyla. The book is concise treatment of the subject, beginning with historical development of taxonomy, followed by consideration of species and classification in higher categories. The second part of the book is devoted to taxonomic proce-

dures. It ends with a large section on zoological nomenclature.

TIME'S ARROW AND EVOLUTION, by Harold F. Blum. Princeton University Press, Princeton, N. Y., 1951. 222 pp., 11 tables, 20 fig., \$4.00.

575 QH331.B55 51-11726

This book has created quite a stir in the realms of biological thinking, especially along evolutionary lines. Dr. Blum takes up Eddington's term "time's arrow" as applied to the second law of thermodynamics, and shows how it has pointed the direction of evolution from the very origin of the universe, not from the origin of life on the earth. As such, evolution would have been channeled in course, restricted and limited from the time of the very beginning of life.

TREES OF THE WESTERN PACIFIC REGION, by Hugo Kraemer. Tri-State Offset Co., 817 Main St., Cincinnati 2, Ohio, 1951. 436 pp., 156 fig., 4 tables, \$5.50

582.16 QK490.S6K7 51-6143

Included in this book are trees found in Burma, Malaya, Thailand, Sumatra, Java, Borneo, Indo-China, Formosa, the Philippines, Celebes, the Moluccas, the Bismarks, New Guinea and the Solomons. Many of these trees have not hitherto been described in an American publication. They are all of considerable economic importance. For this reason only those are considered which are found at low elevations, i.e., within easy reach. There are also sections on thatch materials, strength and durability of woods. Not all the trees are mentioned. We knew and used Banyans, Barringtonia, Cocoa, Corypha, Cyathea, and Ficus, to name just a few.

TROUT, by Ray Bergman. Alfred A. Knopf, Inc., 501 Madison Ave., New York 22, N.Y., 1952. 495

pp., 41 plates, \$7.50.
799.1755 SH687.B45 51-11995

Here are seventeen chapters of trout-lore revised and republished since the first edition of 1938, by the best known and admired authority on the subject in the United States. In addition to the sage common sense of the text, there are photos of fly-tying techniques by C. S. Krug, line drawings by Ivin Sickles, and plates in color by the late Dr. Edgar Burke. The text is so much admired and followed by accomplished anglers who make a profession, or at least a whole-sale hobby, of fly fishing, that this book has become a classic in piscatorial literature. Field biologists have been known to be interested in casting an occasional fly, hence this notice here.

VEGETATION OF IOWA, by Henry S. Conard. Department of Publications, State University of Iowa, Iowa City, Iowa, 1952. 166 pp., 4 fig., \$1.00
581.9777 QH1.I58 52-63013

Dr. Henry Conard, Emeritus Professor of Botany at Grinnell College, visiting research Professor in Botany at the University of Iowa, here completes the work initiated originally by Professor Bohumil Shimek who died in 1937. This work is something more than a list of plants; it is an ecological study.

VIRUS MULTIPLICATION, a symposium, ed. by P. Fildes & W. E. Heyningen. Cambridge University Press, 32 East 57th St., New York 22, N.Y., 1953. 320 pp., plates, charts, fig., tables, \$6.50

The second symposium of the Society for General Microbiology, in Oxford, April, 1952, was devoted to the problem of virus multiplication. There were sixteen papers read. They range from protein synthesis, nucleic acids, bacteriophage, phage reproduction, all the way up to the multipli-

cation of insect viruses, fowl tumor viruses, and the possibility of multiplication cycles in neurotropic viruses.

WATER, by Thomson King. The Macmillan Co., 60 Fifth Ave., New York 11, N. Y., 1953. 238 pp., \$3.50
551.46 GB661.K5 53-5919

Thomson King is Director of the Maryland Academy of Science. He is said to have always been happiest when near, on or in water. His book is divided into two parts. The first treats of water and the world. The second deals with water and the life of man. In them is told what water has done to the world and life.

WEATHER BOOK, by Eric Sloane. Duell Sloane & Pearce - Little Brown & Co., 34 Beacon St., Boston 6, Mass., 1952. 90 pp., 81 fig., \$3.75.
551.5 QC981.S57 52-14141

Not only sailors and fishermen have need for the weather eye. Anyone who is interested in horticulture, forestry, or ecology has need to know something more about meteorology than slavish reliance on government weather broadcasts or forecasts. Most of all, those who go up in airships have urgent need of weather knowledge of the sort this very readable and practical book attempts to supply. It is written for the layman to understand. As such, it may be a valuable adjunct to biologists.

WINSTON COLLEGE DICTIONARY. The John C. Winston Co., 1006 Arch St., Philadelphia 7, Pa., 1951. 1276 pp., 12 maps, 3,000 illus.

The publishers of this college edition call attention to the fact that it contains over 100,000 words defined, 3,000 illustrations, and an atlas of the world. There is a good section on the use of the book, and there are appendices dealing with signs and symbols,

tables of weights and measures and standards, foreign words and phrases, names of persons and places, and a chronological table. The appendix devoted to signs and symbols is unique. It includes alphabets of six languages, Braille, telegraphy and signaling shorthand, as well as signs used in architecture, astronomy, botany, chemistry, commerce, electricity, mathematics, medicine and pharmacy, music, proofreading, punctuation, topography, typography and woodcraft.

WONDERFUL WORLD OF INSECTS, by Albro Gaul. Rinehart & Co., Inc., 232 Madison Ave., New York 16, N. Y., 1953. 290 pp., 47 illus., \$4.00
595.7 QL467.G38 52-5578

The author of this work has worked with the U.S.D.A., the New York City Department of Parks, and is since then consulting entomologist for a number of concerns. Formerly President of the New York Entomological Society, he has illustrated this work with forty-seven of his own photographs. He has, in this new venture, tried to emphasize the beneficial aspect of insects, — the 95% which are neutral, if not positively beneficial to man. It has been said that this is natural history at its best.

WOOD CHEMISTRY, VOLS. I & II, ed. by L. E. Wise & E. C. John. Reinhold Publishing Corp., 330 West 42nd St., New York 36, N. Y., 1952. 1343 pp., illus., tables, etc., \$30.00
660.282 TP997.W52 52-10221

Twenty-two collaborators cooperated in the production of this two-volume monograph under the editorship of Dr. Wise of the Institute of Paper Chemistry and Dr. John of the State University of New York College of Forestry, and published under Advertising Management of ACS. It was first published in 1944. Volume I deals with the growth, anatomy and physical properties of wood, the com-

ponents and chemistry of the cell wall, and the extraneous components of wood. Volume II treats of the surface properties of wood, its chemical utilization, biological decomposition and chemical analysis. Pulp, paper, rayon, cellulose, lacquer and plastics, wood technology, botany and agricultural chemists will find these books stimulating and helpful.

YEARS IN MY HERB GARDEN, by Helen M. Fox. Macmillan Co., 602 Fifth Ave., New York 11, N. Y., 1953. 185 pp., 24 plates, 4 plans, \$3.95
635.7 SB351.H5F645 53-8280

The author of this volume has previously written: "Gardening for Good Eating, Gardening with Herbs for Flavor and Fragrance." She has translated from the French: "Abbe David's Diary," "Gardens" by Jean Forestrie, and "The Delectable Garden" by Palissy. She is Director of the American Horticultural Society, member of the Garden Club of America, and an honorary member of the Federation of Garden Clubs of New York State. In this volume Mrs. Fox has brought together masses of information unavailable except in scattered monographs. There are numbers of excellent photographs.

ZOOGEOGRAPHY OF THE SEA, by Sven Ekman. The Macmillan Co., 60 Fifth Ave., New York 11, N. Y., 1953. 417 pp., 121 fig., \$6.50

Sven Ekman was Professor of Zoology at the University of Uppsala in Sweden. This is the first edition of Dr. Elizabeth Palmer's translation of his authoritative work. Beginning with the tropical continental shelf espually in the Central Atlantic-Pacific areas, the author proceeds to the brackish-water areas of the ancient Sarmatic fauna in the Ponto-Caspian region. Thence he takes up the North European and American fauna complicated by ocean currents. The North Pacific

comes next. This is followed by Southwest Africa, South Australia and South America. After devoting most of the book to shelf-fauna, the author devotes the last hundred pages to deep sea forms. There is a 598-title bibliography.

ZOOLOGY, THE SCIENCE OF, by James C. Perry, 1952. 709 pp., 463 fig. \$6.50

590 QL47.P43 52-3573
ZOOLOGY, LABORATORY MANUAL, by James C. Perry, 1952. 160 pp., 2 fig., Bruce Publishing Co., 400 North Broadway, Milwaukee 1, Wis.

This zoology text and laboratory manual come as the result of twenty-five years of teaching experience. The author has set out to prepare this book for those who will not go farther in biology, and for those who will go on to advanced work in the professions. From the concept that organization is the most basic idea in living matter, the book proceeds to take up organization in the structure, origin and function of cells. Thence it proceeds to organization of the vertebrate organisms and the structure and functions of animal phyla. Final chapters are ecological.

WHAT IS YOUR CHAPTER DOING

to

Reactivate our Inactive Chapters?

Attract new Faculty Member Interest?

Elect a New Honorary Member Each Year?

Establish a New Chapter Somewhere?

Expand Your Own Chapter Membership?

WHY ?

When a Living Thing Stops Growing It Has

Begun

To

DIE !

EDITORIALS

ON TO GAINESVILLE!

Dr. Karl Lagler, Chancellor of Phi Sigma, has authorized the Editor to announce that we are accepting the invitation of the American Institute of Biological Sciences to meet with them at the University of Florida during the next annual meeting.

Our Society met with the American Association for the Advancement of Science in St. Louis during the 1952-53 Christmas holidays. Dr. Lagler and the Editor attended the A.I.B.S. national meetings at the University of Wisconsin last September, in Madison.

As a result of some perfectly obvious comparisons on the two types of meeting, both Dr. Lagler and the Editor felt it wise to recommend to the Council that Phi Sigma should try meeting with the A.I.B.S. at least once.

This departure will mean a lot of changes in past Convention procedures. One of them will be that each Chapter will have to elect its delegate THIS SPRING. The delegate will have to be someone who will be sure to attend, who will be back with his own Chapter the following year.

It is not too soon for the Chapters to begin laying their plans accordingly.

WE CHANGE PRINTERS

The Chapter Delegates at the St. Louis Convention of Phi Sigma a year ago gave forth a mandate which was concerned with greater economy in the publication of the BIOLOGIST. Each Chapter Delegate was ordered to secure at least one bid from a reputable printer in the Chapter's home area and submit it to the Committee on the BIOLOGIST.

This was the substance of the resolution submitted by the Auditing Committee and approved unanimously by all the Chapter representatives in convention assembled. Like many, if not most, such resolutions, nothing was done about it by anybody. Up to now no single word has come from any Chapter Delegate, and the BIOLOGIST Committee, which consisted of Miss Kann of Kappa, Messers Lentifer of Chi and Templeton of Alpha Rho, chairmanned by Mr. Kreitzer of Alpha Omicron, has been as silent as the proverbial clam ever since.

Obviously, if any change in publisher or publishing place was to be made, the most appropriate time would be after the retirement of Mr. Milligan, the respected Vice-President of the Kistler Stationery Company, who for many years had taken personal supervision of our publishing work. In a letter to the Editor, Mr. Milligan candidly admitted that publishing costs in Denver were unusually high.

The Editor of the BIOLOGIST waited until his patience ran out. Then he took the bull by the horns, and secured a tentative bid from a publishing house in the neighborhood of his own college. As a result of his inquiry, The

Journal Publishing Company of Depere, Wisconsin, offered a bid which looked very good. This concern agreed to furnish the Editor with the usual number of copies of the BIOLOGIST at so substantial a reduction of the previous costs that it seemed worth trying. Depere happens to be a paper manufacturing town situated in the Fox River valley in which are concentrated some dozen or more nationally known manufacturers of all kinds of papers.

While the bid price offered by the Journal Publishing Company was almost a third of what each copy of the BIOLOGIST had previously cost the Society, the Editor realized that he would have to assume responsibility for all those services which had previously been afforded by Mr. Milligan and his publishing house. These included running proof and correcting it, actual make-up and all those other activities which go by the name of "dummying," and, after the issues were printed, mailing them out to the Chapters, present and past Council Officers, and the like.

Nevertheless the Editor submitted the proposal to the Council and secured a majority vote of approval, sufficient to warrant his going ahead with the deal.

This issue of the BIOLOGIST is the result. It has taken a lot of time. It is not nearly as fine a copy as our former publishers put out, but with more experience on the part of both Editor and the printers, we should soon notice a decided change for the better.

This is the third change of printers in Phi Sigma's thirty-seven years of existence. That is, in itself, something of a record. It would not have occurred now, were it not for the expressed will and mandate of the Chapters, through their appointed delegates. Now it is up to the Chapters to rally 'round and help the Editor.

CAN CHAPTERS HELP EDIT?

If the Chapter Officers would only save the annual letter of instructions sent to their Secretary at the beginning of each Fall Semester, they would realize that they can do a lot to help with the BIOLOGIST.

The Editor has no means of contact with the Chapters except through the Council Officers. Years ago one of the conventions revised the Phi Sigma Constitution to the extent of adding a Chapter Editor to the local unit officers. Only a handful of Chapters ever implemented this provision by doing so. Here is the result. It goes to prove that Chapters get what they are willing to work for, and no more.

When the printing changeover which this issue signalizes was in the making, the Editor appealed in desperation to the Council Secretary for aid. It seemed impossible to secure accurate information as to the number of BIOLOGISTS to have printed.

Secretary Orcutt immediately sent out an air mail mandate to all Chapters to let the Editor know how many BIOLOGISTS would be needed. As this issue goes to press, only 25 of the 33 Chapters have sent in their estimate of copies wanted. The Council will have to do some broad guessing about the rest.

Of the 25 Chapters which did respond, most of them sent in only the address of the Chapter Officer to whom the copies should be sent. Only ten (10) Chapters were good enough to include the list of their officers for this semester or college year.

As you will notice if you are curious enough to look through the last section of the issue devoted to Chapter Officers, news and activities, most of the news items were submitted by the officers of the 1952-53 scholastic year. Virtually nothing has come from this year's groups.

Right here is where Chapter members can render through their officers

much valuable assistance in making this journal what it wants to be, a cooperative effort. All our biennial Conventions have never been able to work out a fool-proof method of procedure which would insure perfect functioning by all concerned.

We have editorially suggested in our comments to some of the Chapter suggestions that perhaps it is time for us to begin running in each issue a permanent list of the detailed duties of each Chapter as well as Council Officer.

These have, for the most part, never been completely codified. The Phi Sigma Constitution, like all really worth-while constitutions, merely covers officer functions in a broad way. Time and circumstances have added here and subtracted there from the duties of each Council Officer, and local conditions have had a similar effect on Chapter Officers and their functions.

This is as it should be. There has to be a large degree of flexibility in adaptation to local conditions if the Phi Sigma Society is to continue to grow and flourish. Any biologist knows that much.

But there has to be a considerable area of community action which is mandatory on all officers, Council and Chapter alike. Otherwise there will be all sorts of localized aberrations, not to say abortions, in Chapter activities.

Chapter Officers and Chapter Members are therefore earnestly requested to read over every item on the inside back cover of this and every future issue of the BIOLOGIST. Maybe we can all get together, and continue to pull together, for the good of Phi Sigma and all concerned.

Delegates to the 1952 Convention in St. Louis:

When you pledged your own and your Chapter's efforts to reactivate an old, or establish a new, Chapter in Phi Sigma, DID YOU MEAN IT ? ? ?

If You Did, What Have You Done?

Others are doing things, why not you?

CHAPTERS, OFFICERS AND ACTIVITIES

Each issue of the *BIOLOGIST* devotes this section to such of the activities of the Chapters as the respective Editors, Secretaries, or Council Representatives see fit to send it. As a medium of inter-chapter idea-exchange it offers opportunities for the chronicling of local events important in the society, lists of initiate's names, etc.

Local Editors are expected to keep the Editor of the *BIOLOGIST* informed of a) changes in the officers of their chapters; b) names of initiates; c) names or those who receive the Phi Sigma Awards, d) other chapter activities, honors to chapter alumni, significant events among the biologists on their respective campuses.

BETA

—University of Michigan
Ann Arbor, Michigan

C. Sec.—Edward J. Kormody, 2048
University Museums

Beta Chapter requests 100 copies of this *BIOLOGIST*. Last year's Corresponding Secretary complained of not getting enough copies of each issue.

EPSILON

—University of Denver
Denver, Colorado

Sec.—Beverly Dotson

Cp.—Dr. Frederick Zeiner, Dept. of
Zoology.

Epsilon Chapter requests 15 copies of this *BIOLOGIST*. The Chapter held only one meeting during the Fall quarter due to circumstances beyond their own control.

ZETA

—University of Wisconsin
Madison, Wisconsin

Pres.—Eldon Zicker, Dept. of Soils,
104C Soils Bldg.

V-Pres.—Norman Franke, Dept. of
Pharmacy, 392 Chemistry Bldg.

C. Sec.—J. Johanna Jones, Dept. of
Botany, 203 Birge Hall.

Treas.—Martin Massengale, Dept. of

Agronomy, 314 Moore Hall.
Ed.—Homer Walker, Dept. of Bac-
teriology, Agricultural Hall.

Zeta Chapter requests 225 copies
of the *BIOLOGIST*.

ETA

—University of Akron
Akron 4, Ohio

Ed. (*actg.*)—Dr. Ealter C. Kraatz,
Biology Dept.

Eta Chapter requests 18 copies of this *BIOLOGIST*. In reply to their justifiable complaint about receiving no copies since the February issue a year ago, the editorial section in this issue will give an explanation which will be acceptable if not altogether satisfactory.

KAPPA

—University of Kansas
Lawrence, Kansas

Pres.—Bernard Greenberg, Dept. of
Entomology.

V-Pres.—Carlton W. Pryor, Dept. of
Zoology.

Treas.—Wendell V. Showalter, Dept.
of Botany.

C. Sec.—G. Thomas Truffelli, Dept.
of Bacteriology.

R. Sec.—Leland E. Keller, Dept. of
Anatomy.

Ed.—William J. Hausler, Jr., Dept. of Bacteriology.
C. Rep.—Mrs. Ruth K. McNair, Dept. of Biology.

Kappa Chapter requests 150 copies of the *BIOLOGIST*. Secretary Truffelli suggests that the "Current Letter of Instructions" was not received by Kappa. The Editor would like to offer the alternative of running all such directives in the back part of each issue so that there never would be any question of what is expected from any Council or Chapter Officer at any time. What does Kappa think of that idea?

Chapter Editor William Hausler reports:

Our first meeting of the year was held on October 24, 1953, at which time the above new officers were elected.

On November 17, 1953, the Kappa chapter of the Phi Sigma Society initiated 26 new members. Their names and departments are as follows: ANATOMY, Jerry Weisberg; BACTERIOLOGY, Robert W. Atchison, Maria L. Danguilan, Barbara K. Joyce, Paul A. Little, Andrew Nachtigall, Lendell A. White; BIOCHEMISTRY, Robert C. Hildebran, Edward J. Sarcione; BOTANY, Emily Lou Hartman, Frank L. Madinger; ENTOMOLOGY, Warren T. Atyeo, Paul R. Ehrlich, Ellis B. Haden, Jr.; PHARMACY, Dr. Raymond E. Hopponen, Dr. Duane G. Wenzel; PHYSISC-BIOPHYSICS, Bennie S. Friesen, Dr. Frank E. Hoecker, William F. Kunz; PHYSIOLOGY, Herbert G. Ewy, William B. Wood; PSYCHOLOGY, William D. Thompson; ZOOLOGY, Pete S. Chrapliwy, Mary E. Hobson, Dr. Charles A. Leone, Dwight R. Platt.

Following the initiation ceremony the chapter was addressed by Dr. William C. Young, Dept. of Anatomy, University of Kansas. His topic for the evening was "An Endocrinologist Looks at the Kinsey Report."

In order to gain another point of view, on December 8, 1953, Dr. Sigmund Gundle, Psychiatrist, Student Health Service, University of Kansas, spoke on "A Psychiatrist Looks at the Kinsey Report."

LAMBDA

—Montana State University
 Missoula, Montana

C. Sec.—G. St. Onge, 501 University Ave.

Lambda Chapter requests 15 copies of this *BIOLOGIST*. Secretary St. Onge reports that their Chapter does not have the current letter of instruction in their files. Our suggestion to Kappa Chapter applies here too.

NU

—Washington and Jefferson College
 Washington, Pa.

C. Sec.—Francis J. Hornicek, Biology Dept.

Nu Chapter requests 25 copies of this *BIOLOGIST*.

PI

—Emory University,
 Emory University, Georgia.

Treas.—Don Dobbs, Dept. of Biology
 Pi Chapter requests 25 copies of this *BIOLOGIST*.

RHO

—University of Illinois
 Urbana, Illinois

Pres.—Julius Greenstein, Dept. of Zoology, 345 Natural History Bldg.

V-Pres.—Ronald Bergman, Dept. of Physiology, 401 Natural History Bldg.

Sec.—Ayeré Yusa, Dept. of Zoology, 345 Natural History Bldg.

Treas.—Tom Nielson, Dept. of Physiology, 401 Natural History Bldg.

Ed.—Vincent Gallichio, Dept. of Zoology, 103 Vivarium Bldg.

Rho Chapter requests 204 copies of this *BIOLOGIST*. Last Spring the

retiring Chapter Editor, Dick Van Gelder sent in the following news:

In less than an hour I will turn over the office of Chapter Editor to Vince Gallichio, and I thought that I would spend this last bit of time finishing up my duties and getting a little chapter news off to you.

Personally I think that the Rho Chapter had a very successful year. We had fair attendance at our meetings, some excellent talks, a fine banquet, and we initiated forty-seven new members. The Phi Sigma Research Award was given to Lyle E. Hansen for his research on Newcastle's Disease. I don't seem to have a complete copy of our talks for this semester, but among them were Dr. H. H. Ross, "The Origin and Composition of the Nearctic Insect Fauna," Dr. H. B. Mills, "Conflagration and Civilization," and Dr. Frederick Sargent, "Survival Rations."

Let me congratulate you on the last issue of the "Biologist" — it really looked good!

Best of luck for next year — it has been a pleasure working with you. I am already looking forward to seeing you again at the next Phi Sigma convention.

To all of which your Editor has only to be grateful, — mostly that Dick plans to come to the next Phi Sigma convention.

In November Chapter Editor Gallichio sent in the following news:

With apologies for not doing so sooner, I'm enclosing a copy of the Rho Chapter program for the year. Copies of this program were sent to all members and posted on all of the bulletin boards on the campus. In addition, colored posters with a large Phi Sigma seal announced each lecture a week or so in advance, notices of the meetings were included in the weekly University Calendar, and short news articles appeared in the two local newspapers and in the Daily Illini. As a result of this publicity the attendance has been excellent at the first two

meetings.

Dr. McGregor's talk was concerned with his excavations of Indian sites in Arizona and his attempts to reconstruct these early cultures. Dr. Kitzmiller discussed his eight months as a Fulbright Fellow at the University of Pavia and his visits to other noted laboratories in Austria, France, England, and Germany as well as in Italy. Both talks were illustrated with kodachrome slides.

When Rho Chapter sets out to announce a meeting they do it up brown. We reproduce a copy of last April's announcement. It is so well handled that it is no wonder that Rho gets good attendance.

Phi Sigma
presents
SURVIVAL RATIONS
by

DR. FREDERICK SARGENT II
U. S. Air Force

How long can a man survive without food and still have enough energy to carry out his normal duties? Which of the three major food categories — fat, protein, or carbohydrate — would give a man the most efficiency under survival conditions? How long can a person remain efficient on a high fat diet? on sugar cubes? on chocolate bars? These are just a few of the questions which the U. S. Air Force is attempting to answer through its project on the U. of I. campus. Since last fall a group of 40 scientists and experimental subjects have been working on this problem of finding a survival ration which is light, compact, palatable, and which will provide the greatest amount of energy.

Dr. Frederick Sargent II, on leave from the faculty of the Department of Physiology for duty with the Air Force, is in charge of this investigation. A graduate M.D. of Boston University, Dr. Sargent has conducted experiments of this type in the past as well as having served as a subject for research himself.

The Air Force Project incorporates phases of all branches of biology, particularly physiology, nutrition, and psychology. Its applications are far-reaching — from a lone man adrift in a life raft to a huge city isolated by flood, fire, or bomb attack.

Be sure to hear Dr. Sargent's talk on
SURVIVAL RATIONS

229 Natural History Building
7:30 p.m. April 14, 1953

Sponsored by:

Rho Chapter - Phi Sigma Society

SIGMA

—University of Florida
Gainesville, Florida

C. Sec.—Joseph M. Campo, College
of Pharmacy.

Sigma Chapter requests 50 copies
of this BIOLOGIST.

UPSILON

—Miami University
Oxford, Ohio

Pres.—John H. Cross, Jr., 26B Vet-
erans Village

V-Pres.—Lawrence Barrie Hunt, Phi
Kappa Tau

Sec.—Carl W. Albrecht, Jr., 117 W.
High St.

Treas.—Carolyn Carman, 336 Ham-
ilton Hall

C. Rep.—David W. Bergstrom, 6
Tallawanda Apts.

Upsilon Chapter requests 20 copies
of this BIOLOGIST.

CHI

—Montana State College
Bozeman, Montana

Pres.—Harold Picton, Hudson House

V-Pres.—Dorothy Squires, 1119 S.
5th St.

C. Sec.—Betty Lee Miller, Quad D.

R. Sec.—Aura Lee Sandy, E. Lamme
St.

Treas.—Lloyd Casagrande, 7022 S.
Wilson

Ed.—David Koehler, 11 College

Chi Chapter requests 30 copies of
this BIOLOGIST.

OMEGA

—University of Oklahoma
Norman, Oklahoma

C. Rep.—Dr. A. I. Ortenburger,
Dept. of Zoology.

Last March, the then Chapter Edi-
tor, Horace A. Hayes, sent us the fol-
lowing item:

Phi Sigma, honorary biological fra-
ternity, recently conducted an initia-
tion for 17 pledges.

A dinner followed the initiation.
Dr. E. E. Dale, research professor
emeritus of history, was guest speaker
for the occasion.

Those initiated were:

Norman Seymour Davis, graduate,
New York, N. Y.; Virgil Eugene
Dowell, graduate, Lebo, Kan.; Don-
ald Neal Faulkner, graduate, Harlan,
Ky.; Helen Marie Hooper, senior, Ok-
lahoma City; Hamilton McKee John-
son, graduate, Ardmore; Marvin R.
Laubach, graduate, Okeene; Janice
Jeannine Palmquest, junior, Ponca
City, and Lorraine Cecelia Peissner,
graduate, State College, Pa.

Martha Ann Riggins, graduate,
Ada; William Lee Savage, graduate,
Oklahoma City; Ralph Asa Scott,
graduate, Sterling, Ill.; Edward Need-
ham Smith, graduate, Oklahoma City;
Roger Lee Smithpeter, junior, Geary;
Phillip B. Summers, graduate, Semin-
ole; Mary Ellen Stanton Thomas,
graduate, Clyman, Wis.; Dorothy
Pauline Trostle, graduate, Tecumseh,
and Charles Edward Wright, gradu-
ate, Canyon, Tex.

ALPHA BETA

—Mount Union College
Alliance, Ohio

Sec.—Mary Ann Close, Elliott Hall

Alpha Beta Chapter requests 17
copies of this BIOLOGIST.

ALPHA EPSILON

—University of Pittsburgh

Pittsburgh 13, Pennsylvania

Pres.—Steve Olah, Dept. of Biological Sciences

C. Sec.—Maryellen Carroll, Dept. of Biological Sciences

Alpha Epsilon Chapter requests 125 copies of this BIOLOGIST.

ALPHA IOTA

—Bucknell University
Lewisburg, Pennsylvania

Pres.—Margaret Ann Irland, 5 Market St.

V-Pres.—Martin Castelbaum, S.A.M. House

Sec-Treas.—Dorothy Helen Geen, W340

C. Rep.—Roy C. Tasker, Prof. of Biology

Alpha Iota Chapter request 25 copies of this BIOLOGIST.

ALPHA KAPPA

—Hunter College
New York City

Pres.—Aida Colon, 122 East 103 St., (29)

V-Pres.—Sonia Kroland, 105 Arden St., (34)

C. Sec.—Muriel Sperber, 14 East 54th St., Brooklyn 3

R. Sec.—Jean Kirchert, 171-21 Courtney Ave., Flushing 58

Treas.—Hannah Sussman, 102 Cumberland Walk, Brooklyn 5

Fac. Ad.—Dr. Beatrice K. Kronheim, Department of Physiology

Alpha Kappa Chapter requests 47 copies of this BIOLOGIST.

On 16 October last the chapter sponsored a lecture on "Iron Metabolism in the Human Body," by Dr. Daniel Stats, blood specialist with Mt. Sinai Hospital. At the last chapter meeting for the fall semester new officers were elected. They will take charge during the spring term. Jean Kirchert was elected president to succeed Aida Colon. Leah Geller of 168 Amsterdam Ave., (23) succeeds to the

vice-presidency. As secretary Hannelose Rosenberg of 40-20 Fiftieth Ave., Long Island City 4, will handle the records and correspondence. Lois Greve of 357 East 193rd St., Bronx 58 becomes treasurer.

ALPHA MU

—Oregon State College
Corvallis, Oregon

Pres.—Nathan W. Cohen, R. 1, Box 359

V-Pres.—Joseph Capizzi, 530 N. 11th

C. Sec.—Jack E. Roberts, 204 N. 25th

R. Sec.—Frances L. Duryea, 119 N. 9th

Treas.—Steve J. Grilles, 1357 Harrison

Alpha Mu Chapter requests 63 copies of this BIOLOGIST. Accompanying their request were two dittoed sheets giving the complete rosters of active and faculty membership, together with the department in which each member is majoring, and his residence address at the State College. This looks like an idea worth copying.

ALPHA NU

—University of New Mexico
Albuquerque, New Mexico

Alpha Nu Chapter requests 35 copies of the BIOLOGIST.

ALPHA XI

—University of Rhode Island
Kingston, Rhode Island

Pres.—William Gibson

V-Pres.—Joseph DiMase

C. Sec.—Lydia Bernier

R. Sec.—Eleanor Toegemann

Treas.—Beverly Whitman

Ed.—Larry Higgins

Alpha Xi chapter of Phi Sigma initiated nine new members on February 17, 1953. Following the initiation, a talk entitled "The Mortality of the Alewife" was presented by Mr. Joseph J. Graham of the Narragansett Marine Laboratory. A discussion

period was held and refreshments were served.

On March 17, the first two of a series of student papers were presented by Leo Shishmanian and Arthur Goldman. Mr. Shishmanian discussed "Psychosomatic Medicine" and Mr. Goldman's paper was entitled "Control of the Subterranean Termite *Reticulitermes flavipes*". Other papers presented as subsequent meetings were "Gamma Globulin" by Jeanette Smith and "Instrumentation in Neural Response" by Lawrence Higgins.

The annual Phi Sigma picnic was held at the home of Professor and Mrs. De Wolf on April 20. Even though we were forced indoors by bad weather it was an enjoyable event.

Four members of our chapter attended the Annual New England Biological Conference at Boston College on April 25. The senior delegate to the conference was Charles Lamoreux and the junior delegate was Beverly Whitman. The following papers were presented at the conference by members of our chapter: "Phyllotaxis in *Lycopodium*" by Charles Lamoreux and "A Histological Study of Developing Tumors in *Drosophila melanogaster* Larvae" by Donald Levine. An exhibit, "The Biting Insects of New England", was arranged by William Gibson.

The annual banquet of Alpha Xi chapter will be held on May 19, at the Larchwood Inn in Wakefield.

A list of our new members follows: William Gibson, Arthur Goldman, Joseph Graham, Lawrence Higgins, Robert Sarni, Leo Shishmanian, Jeanette Smith, Burton Staugaard, Charles Wentworth.

On May 19th Alpha Xi Chapter formally initiated the following members: Lydia Bernier, Joseph DiMase, Ascanio DiPippo, Gertrude Lustig, Edward Tillinghast, and Eleanor Toegemann. After the initiation which was held in Adams Lounge at the University, the annual Phi Sigma banquet was held at the Larchwood

Inn in Wakefield. Dr. George L. Church of Brown University was the guest speaker.

At the April 28th meeting, a paper entitled "Phyllotaxis in *Lycopodium*" was presented by Charles Lamoreux. At later meetings the following papers or demonstrations were presented: "Alcoholism" by Robert Sarni, "Shallow Water Diving" by Burton Staugaard, "Tumors in *Drosophila*" by Donald Levine, "Phytoplankton Studies in Upper Narragansett Bay" by Ralph Ferra, "Leukemia" by Beverly Whitman and "Interesting Snakes" by William Gibson.

ALPHA OMICRON
—Marquette University
Milwaukee, Wisconsin

Pres.—Peter Amenta
V-Pres.—Louis Pierro
C. Sec.—Helen Wood
R. Sec.—Barbara Heckman
Treas.—Donald Krell
Ed.—Martin S. Ciper
C. Rep.—Dr. James Barrett, Biology Dept.

Alpha Omicron Chapter requests 75 copies of this BIOLOGIST.

Last Spring Alpha Omicron initiated Peter Amenta, David Bachhuber, Edward Jeska, Donald Krell, Walter Loehner, Louis Pierro, Donald Ryan, Richard Ryan and Helen Wood.

On December 15, 1953, the Alpha Omicron Chapter of the Phi Sigma Society initiated eight new members whose names are as follows: Charlotte Barnick, Vitrupe DeSpain, Mary Gasseling, Robert Kinney, Robert Korn, John H. Lee, Chester Mirocha, and Gregory Topetztes.

The annual Phi Sigma Certificate for Outstanding Achievement in Biology was awarded to Richard Ryan who is now enrolled in the Marquette Medical School.

Immediately following the initiation ceremony, the chapter was addressed by the Reverend Claude H. Heithaus, S. J., Professor of Classics

here at Marquette. Father Heithaus chose as the subject of his talk, the "Knowledge of Anatomy as Reflected in Ancient Greek Art."

On January 12, 1954, the chapter was privileged to hear an address by Doctor Walter Zeit, Professor of Anatomy at the Marquette Medical School. Dr. Zeit was ably assisted by Doctor Silas Evans and Doctor Kenneth Brown. "Preliminary Studies in Arteriosclerosis" was the subject of the address.

Investigation of the disease Arteriosclerosis originated from a study of the disease Silicosis. It was found that Cholesterol crystals, which are involved in the formation of lung scar tissue in Silicosis cases, are also involved in the initial formation of connective tissue in cases of Arteriosclerosis. Calcification of this connective tissue is responsible for the "hardened" condition of the arteries.

Doctor Silas Evans was then introduced and he proceeded to describe the way in which the problem was initially attacked. An investigation was undertaken as an attempt to discover some disease associated factor which is constantly present in all Arteriosclerosis cases and constantly absent in all non-arteriosclerosis cases. Certain disease contributing factors were determined and it is the hope that research will uncover a method of recognition of the physico-chemical factors in the blood of individuals which will indicate a potential disease candidate.

The results of preliminary research were described by Dr. Kenneth Brown who stated that certain blood lipoproteins seem to be suspect and that the hormone situation seems to be involved. Moreover, evidence that Arteriosclerosis might someday be adequately treated, has been obtained from investigation of Heparin, a polysaccharide associated with all tissues of the body. Heparin seems to be of greater physiological significance than its function as an anticoagulant.

One of the principal objectives of

research here at Marquette is to develop a blood test which will indicate disease potentiality in an individual.

ALPHA PI

—University of Colorado
Boulder, Colorado

Pres.—Philip A. Buscemi, Dept. of Biology

Alpha Pi Chapter requests 35 copies of this BIOLOGIST.

ALPHA UPSILON

—University of California at Los Angeles
Los Angeles 24, California

Pres.—Eugene Spaziani, Department of Zoology

C. Sec.—Leon Marcus, Department of Bacteriology

Alpha Upsilon Chapter requests 25 copies of this BIOLOGIST.

ALPHA PHI

—College of Puget Sound
Tacoma, Washington

Sec.—Jack W. Cowan

Alpha Pi Chapter requests 20 copies of this BIOLOGIST.

At its annual initiation dinner on December 9, 1953 Alpha Phi Chapter was honored by the presence of Mr. V. R. Bender, park naturalist and Mr. Curtis K. Skinner, acting superintendent from Rainier National Park. Mr. Bender, who had formerly been employed by the Hawaii Natl. Park service, showed some excellent color movies of Hawaii's volcanoes in action, and gave a very instructive talk on the effects of man's ecological experiments on the flora and fauna of the islands.

ALPHA CHI

—University of the Philippines
Quezon City, Philippines

C. Sec.—Magdalena Cantoria, College of Pharmacy

Alpha Chi Chapter requests 150 copies of this BIOLOGIST.

ALPHA PHI

—Virginia Polytechnic Institute
Blacksburg, Virginia

Pres.—Louis R. Hundley, Va. Coop.
Wildlife Res. Unit

Alpha Phi Chapter requests 50 copies of this issue of the BIOLOGIST.

ALPHA OMEGA

—University of Georgia
Athens, Georgia

Pres.—Richard E. Bradley, Dept. of
Biology

C. Sec.—Thomas B. Clarkson

Alpha Omega Chapter requests 60 copies of this BIOLOGIST.

PHI SIGMA AT LARGE

IN THE EDITOR'S MAIL

Dear Dr. Keefe:

I thought you might like to know that we have enjoyed receiving your journal, THE BIOLOGIST, during the past year and that its contents have been very useful during discussions that have arisen in committees and for several projects that we have undertaken. It has proven valuable in the preparation of the Bio-Sciences Newsletter, which is now felt to be one of the most important contributions that the AIBS can make to international scientific cooperation.

We hope you will be able to continue mailing your journal on an exchange basis with the AIBS BULLETIN. If the Institute can be of service to you in any way during the next year, please feel free to write to us at any time.

Sincerely yours,

(Mrs.) Ileen E. Stewart,
Managing Editor,
AIBS BULLETIN.

American Institute of Biological Sciences
Associated with the National Research Council
2101 Constitution Ave.
Washington 25, D. C.

Dear Dr. Keefe:

A note to tell you how much I enjoyed the last issue of "The Biologist." I was particularly interested in your publishing Edward A. Birge's Commencement Address on "Science". As you may remember Dr. Birge was the last living student of Louis Agassiz before Birge died a few years ago. And like Agassiz there is no doubt of the depth and sincerity of Birge's sentiments in point of religion. I like to think that this stemmed from his contact with the Great Teacher.

Agassiz said in *The Essay on Classification*: "To me it appears indisputable that this order and arrangements of our studies are based upon the natural primitive relations of animal life—those systems, to which we have given the names of the great leaders of our science who first proposed them, being in truth but translations into human language of the thoughts of the Creator . . ."

Sincerely yours,

Donald J. Zinn

Asst. Prof. of Zoo.

University of Rhode Island
College of Arts and Sciences

Dear Dr. Lagler:

I am writing this letter in duplicate to thank the officers of Phi Sigma for sending me the current Milligan Issue of "The Biologist." As a former member of Phi Sigma (when a faculty member at William and Mary before the chapter there became inactive), I was particularly interested in and impressed by the entire number.

I appreciate the resolution of your recent St. Louis meeting and the kind words said about the AAAS and me. We were glad to accommodate the biennial meeting of Phi Sigma, as late in the day as your decision was made.

We should be glad to have your Society meet with the Association again whenever you may wish to do so. In December 1954 the AAAS will hold its first national winter meeting on the Pacific Coast — on the campus of the University of California at Berkeley. In December 1956 the Association will meet in the Pennsylvania Zone of New York City. If either or both of these locales appeal to you, please consider this a cordial and specific invitation to Phi Sigma to meet with us.

With appreciation of your courtesy, I am

Sincerely,
Raymond L. Taylor
Associate Administrative
Secretary
American Association for
the Advancement of Science

Dear Dr. Keefe:

Dr. Fred S. Orcutt tells me that you might be interested in carrying an article about the Mountain Lake Biological Station in the Winter Issue of the BIOLOGIST. He suggested that I write a little article and send it directly to you (owing to the short time before that issue goes to press). Since I don't know how much space will be available I am sending you a copy of last year's bulletin, with such corrections as are necessary for it to apply to this summer.

We think Mountain Lake is a wonderful place and it offers opportunities to biologists difficult to duplicate elsewhere in the country. We do not advertize, but I think it would be appropriate to have a short article in your publication for the benefit of biologists who may not have heard of Mountain Lake. You are authorized to put in such pertinent facts as you think would be valuable and of interest. Costs at the Station are unusually low, owing to the fact that the land and buildings were donated and operation costs are supplemented by State funds. However, out of State students pay no more than those from the State.

Sincerely yours,
Bruce D. Reynolds
Director

(THE BIOLOGIST devoted a whole issue two years ago to such summer research and instructional stations as this two years ago. The only complaint we received about it was that it came out too late in the college year for students or professors to think it over, much less make arrangements to attend. We have tentatively set the Fall 1954 issue for another. Ed.)

Dear Dr. Keefe,

Over a year ago I wrote to the president of Zeta chapter of the Phi Sigma Biological Society to determine why I was not receiving and had not received "The Biologist" after having become a member of the society on April 25, 1951. He then referred me to Prof. Tema S. Clare at the Univ. of So. Calif. She replied that I would have to become a member of a local chapter of the society in order to receive the publication. Unfortunately, there isn't a chapter in the Philadelphia area. At the time of my correspondence with her I did receive one issue but have not received one since that time.

I have found "The Biologist" a

very interesting journal and would like to receive it in the future plus any of the back issues that you may have. Any suggestions that you may have to offer pertaining to this matter

will be greatly appreciated.

Yours truly,
Dr. Conrad E. Kruse
42 Ralston Ave.
Havertown, Penna.

HINTS TO THE CHAPTERS

(By popular request the following items are being reprinted in the hope that they will be carefully read, and stimulate the Chapter members into action. Ed.)

HOW TO START A NEW CHAPTER

This is a question that comes up at every biennial convention of Phi Sigma. It isn't at all difficult if you go at it the right way. Practically all the existing chapters started out alike. Alpha took the name of Phi Sigma in 1915. Beta started in 1910 as the Natural Science Club of the University of Michigan. Epsilon was formerly Pi Beta Omega on the Denver campus. Zeta was the Lapham Biological Society at Wisconsin up to May 30, 1917. World War I caused a cessation in chapter organization, but by February 1921 the Axis Society of Akron had been accepted as Eta Chapter, and the Graduate Research Club at Michigan State was under consideration by "The Grand Chapter," as the Council was then known. Many other chapters were formed similarly later on.

Thus we see that the traditional policy has been for Phi Sigma to aggregate an existing organization to its roster or to be instrumental in starting some kind of a biological group, and then after it has worked together for a year or more, bring it into our Society as a new chapter.

The easiest way to start a chapter, then, is to induct an existing organization. Of course, it must be composed of students in the upper third of their classes, who must be actively interested enough in biology to want to become members of a biological organization. In addition to this, their parent university or college should have a large enough faculty in biological fields to warrant the hope that there will always be someone on the campus sufficiently interested in Phi Sigma to keep the chapter alive, if not precisely thriving. A third requirement is that the college should have a graduate school and give at least one degree higher than a bachelor's. It goes without saying that the school must be duly accredited by the regional agency, and that there is no active or inactive chapter of Tri Beta (Beta Beta Beta) on the campus.

If all these requirements are met, all one has to do is to present the advantages of corporate membership in Phi Sigma to the members of the existing organization. As your Editor sees them, the advantages are:

1. Phi Sigma is the oldest existing biological fraternity in the country.
2. It holds membership in the "Association of Honor Societies," and as such, is represented in "The National Conference on College Fraternities and Societies."

3. It is the only *honor* society for biologists listed in Leland's "Fraternity Month" or Banta's "Greek Exchange."
4. It has a membership of 19,000, many of whom, especially among the earlier members, have now risen to the highest places in American or foreign biology.
5. It is more than a mere honor society. Since its first national constitution was adopted, it has always been designated as an honorary, biological *research* society.
6. With this last idea in mind, Phi Sigma refuses to establish chapters on any campus where there is no graduate school.
7. Phi Sigma stands for scholastic excellence as well as productive scholarship.

Read over your copy of the Society's Constitution and By-laws and you will probably discover other arguments in favor of Phi Sigma.

Where there is no existing organization to adopt ready-made, it will take a little longer, but is not too difficult. With a little local help, a few interested kindred spirits can generally be found on almost any campus to form a nucleus around which to build a pilot organization for a future chapter.

In a great university, there will probably be a large oversupply of eligible personnel. Here are the fields from which the original chapters of Phi Sigma were recruited:

- Agriculture
- *Agricultural Chemistry
- Agronomy
- Anatomy
- Animal Husbandry
- Anthropology
- Apiculture
- Bacteriology
- Biology
- *Biochemistry
- Biometry
- *Biophysics

- Botany
- Cytology
- Dairying
- *Dental Sciences
- *Dietetics
- Ecology
- Embryology
- Entomology
- *Eugenics
- *Field Crops
- Fisheries
- *Forestry
- *Geology
- Genetics
- Histology
- *Home Economics
- Horticulture
- Hygiene
- Immunology
- *Medical Sciences
- Micrology
- *Nutrition
- *Oceanography
- Ornithology
- Palaeobotany
- Palaeontology
- Parasitology
- *Pathology
- Pharmacognosy
- Pharmacology
- Physopathology
- Plant Chemistry
- Plant Physiology
- Physiology
- *Psychology
- Soil Science
- Taxonomy
- *Veterinary Science
- Zoology

Asterisked fields indicated the necessity for a student being interested or working in the *biological* aspects of this branch of science. This is the list as it appeared in the September-December 1934 issue of "The Biologist." It is only a slightly emended form of the 1925 constitutional convention list as compiled in that first national meeting in Washington. The Editor feels that the following fields might well be considered as worthy of addition to the list:

Algology

Animal Nutrition
 Animal Pathology
 Endocrinology
 Enzymology
 Food Technology
 Limnology
 Medical Technology
 Phycology
 Wild Life Management

The Council will have to speak on this matter first.

It would be hard to find a college or university on the approved list of eligible institutions, given elsewhere in this issue, where enough of these subjects would not be taught. From among them a respectable number of intellectually high-ranking graduate students, seniors and juniors, ought to be available to form a pilot organization which could then petition for a charter.

CONTACTS TO BE MADE

One of the proposals arising out of the 1952 St. Louis meetings was the possibility of bringing the Phi Sigma Honorary Biological Society to the attention of a larger number of universities and colleges. The Editor does not have the most recent copy of "Lovejoy's College Guide." The following figures, therefore, are based on the 1948 edition of Dr. Brumbaugh's "American Universities and Colleges." As recently as that year these institutions:

1. Were in good standing with their regional accrediting associations.
2. Offered degrees higher than the bachelor's.
3. Had no chapter of Phi Sigma or of Beta Beta Beta as far as is now known.
4. Had biology staffs of sufficient size to warrant establishment of Phi Sigma chapters *if sufficient interest were shown* or could be stimulated.

This list gives the name and location of the institution, whether it confers the bachelor's and master's or

doctor's degrees, and the enrollment for 1946-47.

Alabama Polytechnic Institute, Auburn, Ala. (BM) 6,198
 Alabama, University of, University, Ala. (BM) 8,626
 Alfred University, Alfred, N. Y. (BM) 870
 Arizona, University of, Tucson, Ariz. (BMD) 4,484
 Atlanta University, Atlanta, Ga. (BM) 2,110
 Boston College, Chestnut Hill, Mass. (BM) 4,863
 Boston University, Boston, Mass. (BMD) 14,810
 Brooklyn College, Brooklyn, N. Y. (BM) 13,343
 Brown University, Providence, R. I. (BMD) 4,353
 Bryn Mawr, Bryn Mawr, Pa. (BMD) 698
 Buffalo, University of, Buffalo, N. Y. (BMD) 9,442
 Butler University, Indianapolis, Ind. (BM) 4,858
 Catholic University of America, Washington, D. C. (BMD) 3,700
 Chicago, University of, Chicago, Ill. (BMD) 12,366
 Cincinnati, University of, Cincinnati, Ohio (BMD) 16,042
 City College, New York, N. Y. (BM) 29,261
 Clark University, Worcester, Mass. (BMD) 840
 Colorado College, Colorado Springs, Colo. (BM) 1,151
 Columbia University, New York, N. Y. (BMD) 29,245
 Connecticut, University of, Storrs, Conn. (BM) 6,707
 Cornell University, Ithaca, New York (BMD) 9,702
 Creighton University, Omaha, Neb. (BMD) 2,948
 Dartmouth College, Hanover, N. H. (BM) 2,822
 Delaware, University of, Newark, Del. (BM) 2,263
 Detroit, University of, Detroit, Mich. (BMD) 7,489

- Fisk University, Nashville, Tenn. (BM) 976
 Fordham University, New York, N. Y. (BMD) 8,150
 George Peabody College, Nashville, Tenn. (BMD) 1,767
 George Washington University, Washington, D. C. (BMD) 14,911
 Georgetown University, Washington, D. C. (BMD) 4,291
 Gonzaga University, Spokane, Wash. (BM) 1,620
 Harvard University, Cambridge, Mass. (BMD) 12,076
 Haverford College, Haverford, Pa. (BM) 465
 Hawaii, University of, Honolulu, H. T. (BM) 2,962
 Howard University, Washington, D. C. (BMD) 6,187
 Idaho, University of, Moscow, Idaho (BM) 3,451
 Illinois Institute of Technology, Chicago, Ill. (BMD) 7,377
 Illinois State Normal, Normal, Ill. (BM) 1,800
 Illinois Wesleyan University, Bloomington, Ill. (BM) 1,131
 Indiana University, Bloomington, Ind. (BMD) 10,350
 Iowa State College of A & M, Ames, Iowa (BMD) 10,480
 Iowa State University, Iowa City, Iowa (BMD) 9,770
 Johns Hopkins University, Baltimore, Md. (BMD) 5,879
 Kansas City, University of, Kansas City, Mo. (BMD) 3,350
 Kansas State College, Manhattan, Kansas (BMD) 6,507
 Kent State University, Kent, Ohio (BM) 4,763
 Kentucky, University, Lexington, Ky. (BMD) 6,638
 Lehigh University, Bethlehem, Pa. (BMD) 3,375
 Louisiana State A & M College, Baton Rouge, La. (BM) 10,603
 Louisville, University of, Louisville, Ky. (BMD) 5,705
 Loyola University, Chicago, Ill. (BMD) 7,140
 Loyola University, New Orleans, La. (BM) 2,701
 Manhattan College, New York, N. Y. (BM) 2,242
 Marshall College, Huntington, W. Va. (BM) 3,333
 Maryland, University of, College Park, Md. (BMD) 11,020
 Massachusetts Institute of Technology, Cambridge, Mass. (BMD) 5,172
 Massachusetts, University of, Amherst, Mass. (BMD) 1,697
 Minnesota, University of, Minneapolis, Minn. (BMD) 27,103
 Missouri, University of, Columbia, Mo. (BMD) 14,125
 Mount Holyoke College, South Hadley, Mass. (BM) 1,191
 New York State College for Teachers, Albany, N. Y. (BM) 1,321
 New York University, New York, N. Y. (BMD) 41,787
 Niagara University, Niagara, N. Y. (BM) 1,701
 North Carolina, University of, Chapel Hill, N. C. (BMD) 6,802
 Notre Dame University, Notre Dame, Ind. (BMD) 4,532
 Oberlin College, Oberlin, Ohio (BM) 2,180
 Ohio University, Athens, O. (BM) 4,933
 Pennsylvania State College, State College, Pa. (BMD) 10,365
 Pennsylvania, University of, Philadelphia, Pa. (BMD) 18,649
 Princeton University, Princeton, N. J. (BMD) 3,938
 Purdue University, Lafayette, Ind. (BMD) 11,505
 Radcliffe College, Cambridge, Mass. (BMD) 1,274
 Rochester, University of, Rochester, N. Y. (BMD) 4,830
 Rosary College, River Forest, Ill. (BM) 756
 St. Bonaventure College, St. Bonaventure, N. Y. (BM) 1,261
 St. John's University, Brooklyn, N. Y. (BMD) 6,308
 St. Louis University, St. Louis, Mo. (BMD) 10,328

San Francisco, University of, San Francisco, Calif. (BM) 2,024
 Seton Hall College, South Orange, N. J. (BM) 8,534
 Simmons College, Boston, Mass. (BM) 1,538
 Smith College, Northampton, Mass. (BM) 2,249
 South Carolina, University of, Columbia, S. C. (BM) 4,167
 Stanford University, Stanford, Calif. (BMD) 7,203
 Stevens Institute of Technology, Hoboken, N. J. (BM) 1,694
 Syracuse University, Syracuse, N. Y. (BMD) 15,228
 Temple University, Philadelphia, Pa. (BMD) 14,829
 Tennessee, University of, Knoxville, Tenn. (BMD) 8,405
 Texas Christian University, Fort Worth, Texas (BMD) 3,200
 Tufts College, Medford, Mass. (BMD) 3,375
 Tulane University, New Orleans, La. (BMD) 5,953
 Tulsa, University of, Tulsa, Okla. (BM) 2,920
 Vanderbilt University, Nashville, Tenn. (BMD) 3,050
 Vermont, University of, Burlington, Vt. (BMD) 2,065
 Villanova College, Villanova, Pa. (BM) 3,232
 Virginia State College, Petersburg, Va. (BM) 1,213
 Virginia, University of, Charlottesville, Va. (BMD) 4,388
 Washington, State College of, Pullman, Wash. (BMD) 5,884
 Wayne University, Detroit, Mich. (BMD) 15,312
 Wellesley College, Wellesley, Mass. (BM) 1,685
 Wesleyan University, Middletown, Conn. (BM) 900
 West Virginia University, Morgantown, West Va. (BM) 6,015
 Western Reserve University, Cleveland, Ohio (BMD) 16,484
 Wheaton College, Wheaton, Ill. (BM) 1,539 ?

Wichita, Municipal University of, Wichita, Kansas (BM) 2,810
 Wyoming, University of, Laramie, Wyo. (BM) 3,364
 Yale University, New Haven, Conn. (BMD) 8,643

Here, then, are one hundred and six challenges to the present chapters of Phi Sigma. Most of these schools do not know that our society exists. There is every probability in the world that there may be former chapter members on these campuses, who, if they knew the revised status of their own honor society, would be glad to undertake the establishment of a chapter on their new campus.

THOSE VACANT CHAIRS

More or less of a national ballad is a plaintive song with a name somewhat like the title of this article. Every home sooner or later has its vacant chair. So does every fraternity house, especially in times of war, or "police actions." So does every fraternity which is organized on a national scale.

Sooner or later, the inexorable evolutionary processes in nature eliminate the unfit, the unwary or the unwise living organisms. Those social organisms to which the same characteristics can be applied seem destined for a similar fate. Why some of the most promising chapters of Phi Sigma have "folded their tents like the Arabs, and as silently" stolen away, will perhaps always be a mystery. There is no secret why some of them disbanded.

In the hope that conditions on their several campuses have changed sufficiently to warrant reviving their charters, we list them here, with the year of their founding and the last year they were mentioned as active in "The Biologist."

Alpha—University of Ohio, Columbus; 1915-1925.

Gamma—(Reserved for a chapter never founded.)

Delta—University of Maine, Orono; 1917-1934.

Theta—Michigan State College, Lansing; 1921-1936.

Iota—Washington University, St. Louis; 1921-1938.

Mu—University of California, Berkeley; 1922-1944.

Xi—University of Nebraska, Lincoln; 1924-1935.

Omicron—University of North Dakota, Grand Forks; 1924-1928.

Tau—Duke University, Durham, N. C.; 1926-1942.

Alpha Gamma—University of South Dakota, Vermillion; 1928-1931.

Alpha Delta—Lawrence College, Appleton, Wisconsin; 1929-1935.

Alpha Zeta—William & Mary College, Williamsburg, Virginia; 1930-1938.

Alpha Theta—State College of Washington, Pullman; 1930-1943.

Alpha Sigma—University of Texas, Austin; 1946-1950.

Alpha Tau—National University of Mexico, D. F.; 1947-1948.

These are the vacant chairs in the long roster of the forty-seven chapters that at one time might have comprised Phi Sigma. It may very well be that some of these chapters can never be revived. Circumstances may have risen which would permanently preclude any effort to do so. But, — and this is encouraging, — there are signs that some of these campuses may not be inhospitable to resuscitated chapters. There is work here for the live chapters, work that needs doing. Every one of these former Phi Sigma units is a challenge to every living member, here and now.

How Many Biological Fields

Are Represented in

YOUR CHAPTER?

The Less There Are the More

Ingrown You Are.

Ingrowns , . . .

Introverts

Inbreds , . . .

All Cause Trouble, Sooner or Later.

IN THE PHI SIGMA CHAPTER

The President —

1. Calls and presides at Chapter and Executive Committee meetings.
2. Conducts Initiations and Installations as Custodian of the Ritual.

The Vice-President —

1. Acts for and in the absence of the President.
2. Is Chairman of the Membership Committee and directs its activities.
3. Is a member of the Executive Committee.

The Recording Secretary* —

1. Takes Roll Call at all Meetings.
2. Keeps a file of all Chapter Correspondence.
3. Is Custodian of the Permanent File of all members.
4. Is Custodian of the Chapter Insignia and the Charter.
5. Is a Member of the Executive Committee.

The Corresponding Secretary* —

1. Conducts all current Official Correspondence.
2. Reports all Membership Elections to the Council Secretary.
3. Reports number of BIOLOGISTS needed to the Council Treasurer and Editor.
4. Distributes BIOLOGISTS to all Honorary, Faculty and Chapter Members.
5. Is a Member of the Executive Committee.

The Treasurer —

1. Collects all Membership Fees and Local Dues.
2. Pays all Chapter local bills.
3. Transmits all Membership Fees to the Council Secretary.
4. Is a Member of the Executive Committee.

The Editor —

1. Promptly reports all news-worthy Chapter Activities to the Council Editor.
2. Acts as Public Relations Officer for the Chapter.
3. Is not a voting member of the Executive Committee.

The Council Representative —

1. Functions for and with the Council Secretary in default of the local Chapter Officers.

* Where only one Secretary is elected by a Chapter it is expected that both these functions will be carried out by that person.

**PHI SIGMA
BIOLOGICAL HONOR SOCIETY**

"The object of Phi Sigma is to promote interest in biological research. Although always designated as an honorary biological research society, it should be considered as a working guild of biologists interested in research. In effect, election to Phi Sigma should be an opportunity for better work, rather than merely election to an honorary society."

MILE POSTS

- 1915 March 17, Alpha Chapter organized, Ohio State University, Columbus.
- 1916 May, Central Governing Body organized, BIOLOGIST first issued.
- 1917 June, last War-time BIOLOGIST issued.
- 1921 February, BIOLOGIST revived.
- 1924 December, First National Meeting, Constitution revised, Washington, D. C.
- 1925 December, Second National Meeting, First Science Program, Kansas City.
- 1926 December, Third National Meeting, Second Science Program, Philadelphia.
- 1927 December, Third Science Program, Nashville.
- 1928 December, Fourth National Meeting, Coat-of-Arms adopted, Fourth Science Program, New York.
- 1930 January, Council Meeting, Ritual Revised, Norman, Okla.
December, Fifth National Meeting, Fifth Science Program, Cleveland.
- 1931 Phi Sigma Letters Registered, U. S. Patent Office.
- 1932 December, Sixth Science Program, Atlantic City.
- 1933 June, Sixth National Meeting, Seventh Science Program, Chicago.
- 1935 December, Seventh National Meeting, Eighth Science Program, St. Louis.
- 1937 December, Eighth National Meeting, Ninth Science Program, Indianapolis.
- 1939 December, Ninth National Meeting, Tenth Science Program, Silver Anniversary, Ohio State University, Columbus.
- 1941 December, Tenth National Meeting, Dallas, Texas.
- 1946 December, Eleventh National Meeting, Boston, Mass.
- 1948 December, Twelfth Meeting, Eleventh Science Program, Albuquerque, N. Mex.
- 1949 February, Joins the ASSOCIATION OF COLLEGE HONOR SOCIETIES.
- 1950 December, Thirteenth Meeting, Denver and Boulder, Colorado.
- 1952 December, Fourteenth Meeting, St. Louis, Mo.